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# Nutritive Quality of Diets, USA

- *Dietary Levels of Households, Spring 1965*
- *Incidence and Location of Poor Household Diets, Spring 1965*
- *Nutritional Status and Dietary Studies, 1957-1967*

*A Report to the Committee on Agriculture  
of the United States House of Representatives*

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### Committee Directive

At a hearing on S.2138 to "Provide Food and Medical Services on an Emergency Basis" (Stennis Bill) before the Committee on Agriculture, House of Representatives, 90th Congress, 1st Session, October 5, 1967, the following resolution was adopted:

"That the Committee on Agriculture of the United States House of Representatives respectfully requests the Secretary of Health, Education, and Welfare and the Secretary of Agriculture, in consultation and cooperation with other officials of the Federal and State Governments, to make a comprehensive study of the incidence and location of serious hunger and malnutrition and health problems incident thereto in the United States and then report their findings and recommendations for dealing with these conditions to the Committee on Agriculture of the United States House of Representatives as soon as practicable but to submit an interim report within six months from the date of approval of this Resolution."

## NUTRITIVE QUALITY OF DIETS, U.S.A.

Introduction

There are about 1,600 counties in the U. S. today where at least one out of four households has a poor diet--one which experts define as supplying less than two-thirds of a recommended level for one or more nutrients. Many of these are rural counties.

There are 25 counties where more than 50,000 persons are estimated to have poor diets. These are among the largest metropolitan centers.

About 13 million people live in households with poor diets where the incomes are under \$3,000.

These figures are based on the Nationwide Food Consumption Survey showing that 21 percent of the household diets were rated "poor" because they supplied less than two-thirds of one or more nutrients for which the Food and Nutrition Board, National Academy of Sciences-National Research Council, has set Recommended Dietary Allowances. Two-thirds of the allowance for any nutrient is considered a level below which diets could be nutritionally inadequate for some individuals over an extended period of time. Poor diets are conducive to poor nutrition, although the occurrence of poor diets is not synonymous with "serious hunger and malnutrition."

There is no way to relate the findings from the food consumption study directly to malnutrition and the health of the American people. No "comprehensive study of the incidence and location of serious hunger and malnutrition and the health problems incident thereto" has been made on a nationwide basis.

During the past decade, many studies have been made of the nutritional status and food intakes of specific groups in specific locations. The results are summarized for this report and suggest that nutritional health as a whole is satisfactory, but segments of the population still have problems associated with obtaining an adequate diet.

The quality of nutrition was generally related to economic status and level of education. Infants and children from families of the lower economic level tended to be below average in height and weight, suggestive of undernutrition. Obesity was observed in 15-20 percent of approximately 3,000 adolescents studied. Overweight was prevalent in the older population studied. Iron-deficiency anemia was common in pregnant women and infants but was not often noted in 3,000 adolescents studied.

Biochemical and clinical evidences of vitamin deficiencies in this country are relatively rare. Ascorbic acid, vitamin A, calcium, and iron were the nutrients most commonly found in the diets in amounts below the Recommended Dietary Allowances of the Food and Nutrition Board, National Research Council.

While these studies do not justify generalizations of a national scope, they suggest what systematic studies on a nationwide basis are likely to show.

A clearer, more exact picture of malnutrition and health will be emerging this year as the studies now underway through sponsorship by the Department of Health, Education and Welfare are completed. These include the initial phase of a nationwide study of the nutritional status of pre-school children; a statewide study of 12-16 year olds in Louisiana; and a study of nutritional status of a 40,000 to 50,000 sample of children collected through 39 Children and Youth Comprehensive Health Care projects.

Further, studies of nutritional status of individuals in selected areas in 8 States will be getting underway shortly, and these studies will provide the first comprehensive assessment of malnutrition and health of national scope.

While such studies will give us a more precise picture of nutritional status, they will not alter substantially the geographical and cultural factors associated with the poor diets reported here.

Highlights

Preliminary findings of the nationwide survey of food consumption of households made by the U. S. Department of Agriculture in the spring of 1965 suggest that awareness of the foods that make up a good diet, a desire to choose these foods, and sufficient money to buy adequate food must become more universal if all U. S. households are to have good diets.

More specifically the findings indicate that:

1. Amounts of food used in U. S. households were sufficient, on the average, to provide diets meeting the Recommended Dietary Allowances set by the Food and Nutrition Board of the National Academy of Sciences-National Research Council for calories and protein, for the minerals, calcium and iron, and the vitamins, vitamin A value, thiamine, riboflavin, and ascorbic acid. There was great variation, however, in the amounts of foods used by different households.
2. Half of the households had diets that met the allowances for all the nutrients studied. These diets were rated "good." In 1955, 60 percent of the households had good diets. (Figure 1)
3. About one-fifth or 21 percent of the households had diets that were poor (supplied less than two-thirds of the recommended allowances for one or more nutrients). In 1955, 15 percent had poor diets. (Figure 1)
4. The nutrients most often in short supply were calcium, vitamin A, and ascorbic acid. Seventy percent of the diets supplied the allowance for calcium, and about 75 percent for vitamin A and ascorbic acid. These nutrient shortages were associated with use of less-than-recommended amounts of milk and milk products and vegetables and fruit.
5. Ninety percent or more of all the household diets supplied the recommended allowances for protein, iron, thiamine, and riboflavin.
6. At each successively higher level of income a greater percentage of households had good diets but high income alone was no assurance of good diets. (Figure 2)

Highlights - continued

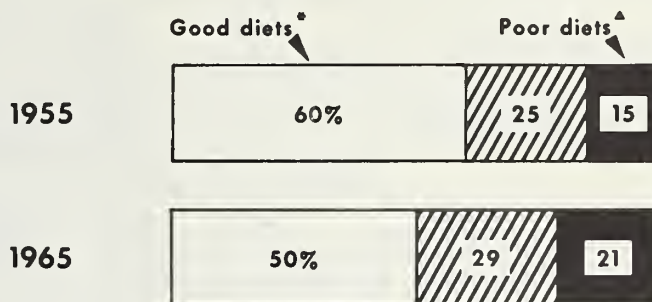
7. Among households with incomes of \$10,000 and over, 9 percent had poor diets. (Figure 2)
8. Among households with incomes of under \$3,000, 36 percent had poor diets. (Figure 2)
9. Slightly more households in the North Central and South had poor diets than in the Northeast and West. (Figure 3)
10. Similar percentages of urban and rural households had "good" and "poor" diets. (Figure 4)
11. The principal differences in household food use in 1965 as compared with 1955 were increases in bakery products other than bread, beef, poultry, soups and mixtures, soft drinks, fruit ades and punches, and decreases in flour and some cereals, fluid milk, and some fruits and vegetables.

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The nationwide sample included 7,500 households selected to represent housekeeping households in each of the four Census regions.

Additional information is given in ARS-62-17, Dietary Levels of Households in the United States, Spring 1965 -- A Preliminary Report.

## QUALITY OF DIETS 1955 - 1965



\* MET RECOMMENDED DIETARY ALLOWANCES (1964) FOR 7 NUTRIENTS

^ HAD LESS THAN 2/3 ALLOWANCE FOR 1 TO 7 NUTRIENTS.

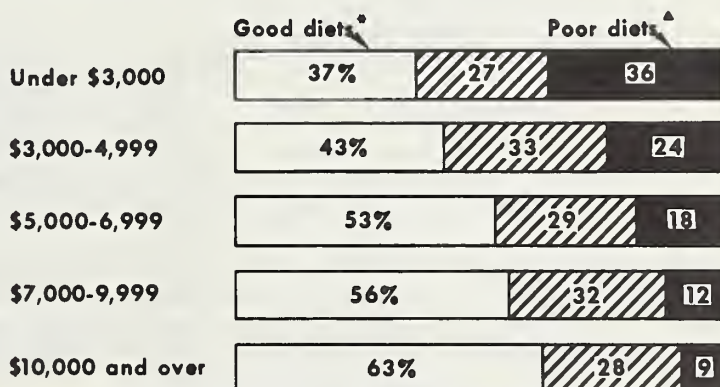
NATIONWIDE HOUSEHOLD FOOD CONSUMPTION SURVEY, SPRING 1955 AND SPRING 1965

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Figure 1

## INCOME AND QUALITY OF DIETS



\* MET RECOMMENDED DIETARY ALLOWANCES FOR 7 NUTRIENTS.

^ HAD LESS THAN 2/3 ALLOWANCE FOR 1 TO 7 NUTRIENTS.

NATIONWIDE HOUSEHOLD FOOD CONSUMPTION SURVEY, SPRING 1965

U.S. DEPARTMENT OF AGRICULTURE

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Figure 2

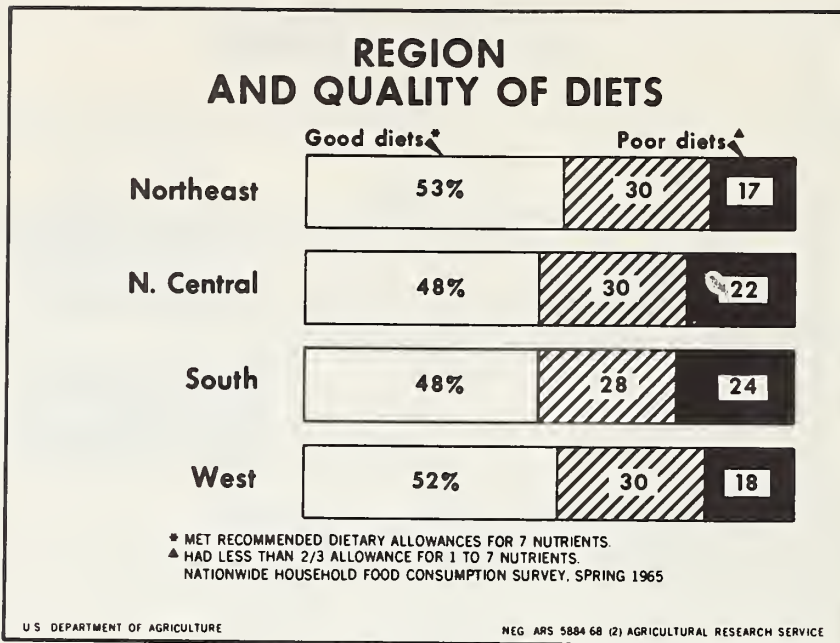


Figure 3

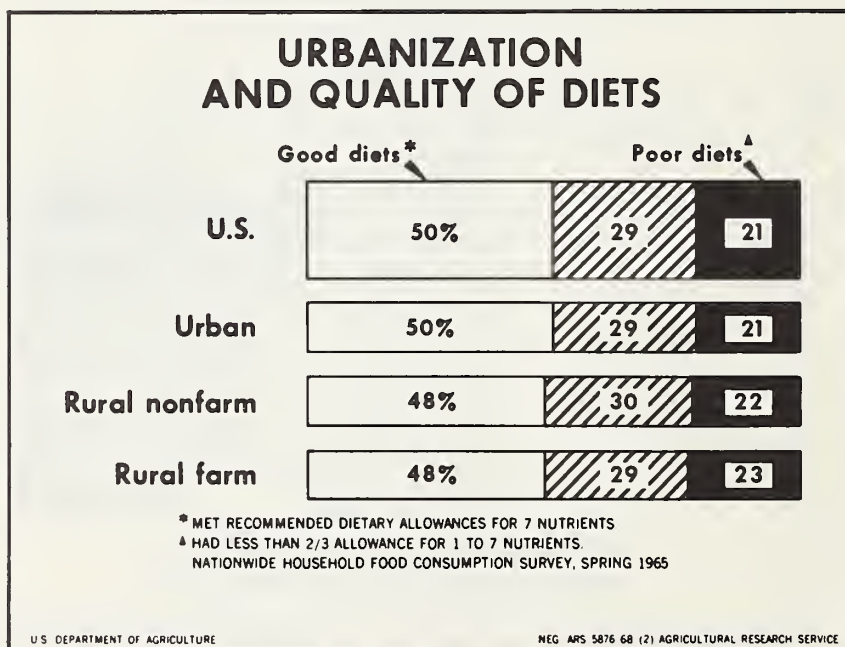


Figure 4

## Distribution of Households with Poor Diets to Counties

Estimates of the concentration and location of households with poor diets by county were derived from the 1965 nationwide food consumption survey in conjunction with Census county statistics on population and income.

Map A summarizes the percent of households with poor diets by county. The large number of heavily shaded areas in the South and North Central Region indicates the relatively high proportion of poor diets in the counties of these two regions. No county, however, had more than 30 or less than 9 percent of its households with poor diets.

Map B summarizes the number of households with poor diets: This map shows that the counties with the greatest number of poor diets are those with large metropolitan areas.

A list of the counties in the U.S. identifying them by their "percent" and "number" class is attached. Each class is approximately a fourth of the total. Several tables summarize the data by region-urbanization and by State.

These estimates of the distribution to counties of the households with poor diets were based on the relationship of family income and percent of poor diets shown by the 1965 survey 1/. Region and urbanization were incorporated along with these factors into a regression equation so that the parts would be properly interrelated. Estimates of the percentage of poor diets were computed from this equation for each county using its mean income, region and urbanization distribution. Mean incomes do not include value of food stamps or other income in kind.

The required county data were 1964 mean incomes--derived from 1959 median incomes 2/ updated from Census region-urbanization data and adjusted to mean values by USDA food consumption survey data--and 1965 counts of households by urbanization--updated from 1960 Census counts on the basis of unpublished 1965 Census data. Adjustments to the number of housekeeping households (the universe for the 1965 survey) were made on the basis of the survey data.

State estimates were made independently by the same method and compared with aggregate county estimates. The discrepancy was never more than 0.2 percent.

Despite the adjustments and assumptions described in the above paragraphs, the procedure is believed to yield reasonable approximations of the concentration and location of households with poor diets. It is possible, however, that individual counties could have been misclassified.

Counties that had no food assistance program as of March 1, 1968, are identified.

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1/ Dietary Levels of Households in the United States, Spring 1965. A Preliminary Report. ARS 62-17, Jan. 1968. Also as yet unpublished data from this survey.

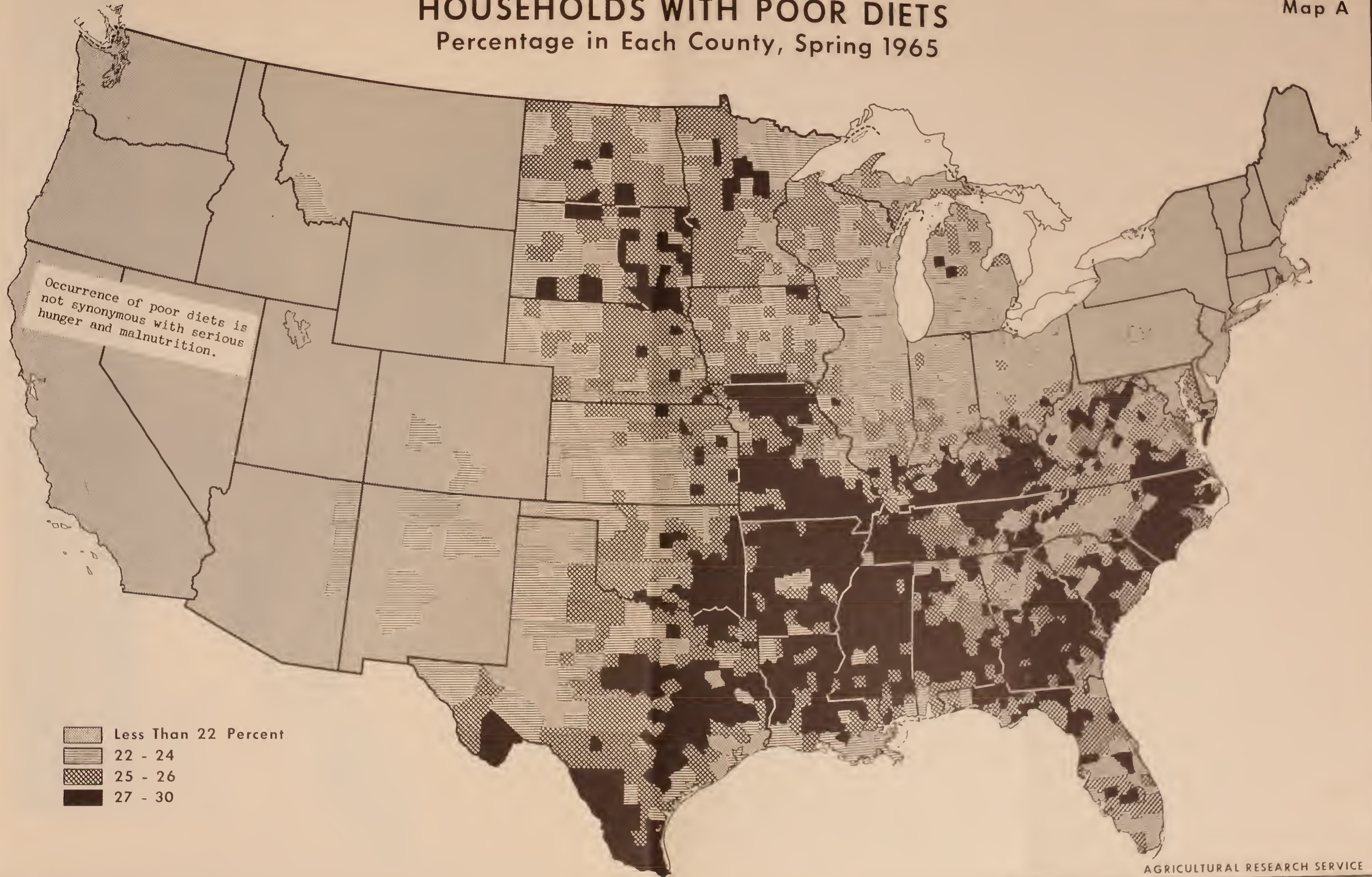
2/ The survey and Census reports of income refer to the year preceding collection of data.



# HOUSEHOLDS WITH POOR DIETS

Percentage in Each County, Spring 1965

Map A



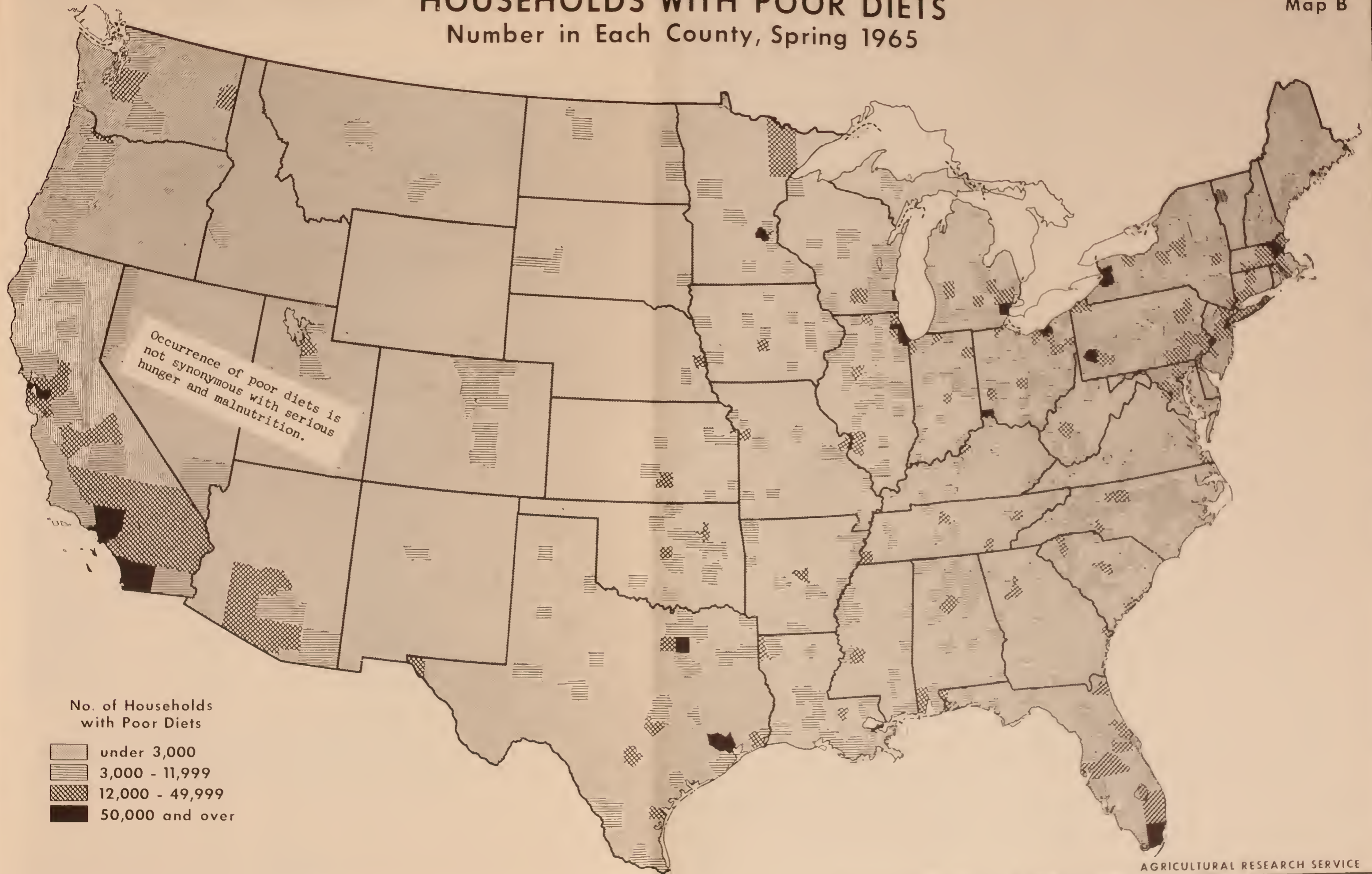
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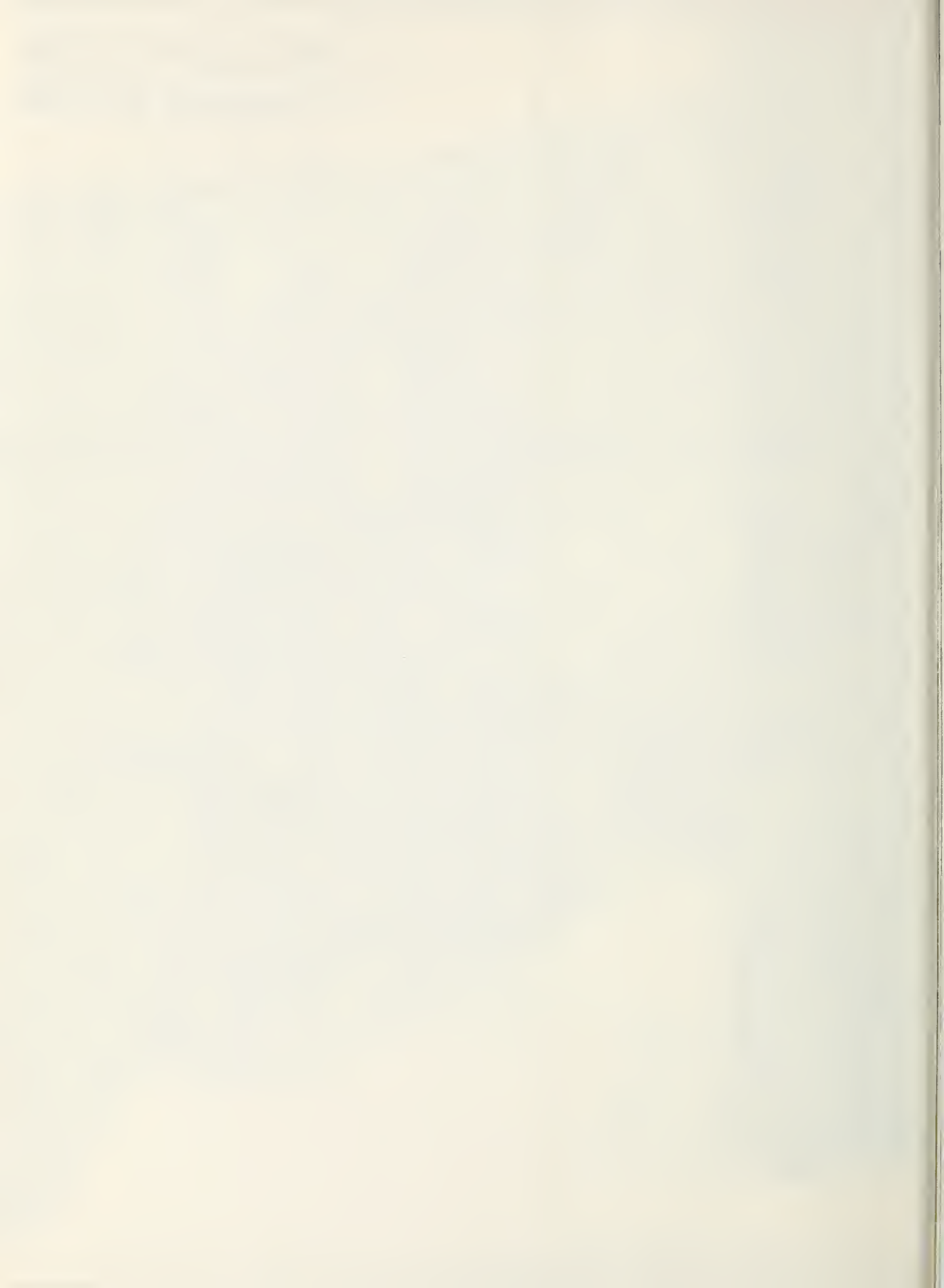


# HOUSEHOLDS WITH POOR DIETS

Number in Each County, Spring 1965

Map B





# POOR DIETS IN COUNTIES, Spring 1965

Following county name:-

Letter indicates  
Percent of households with poor diets:

A Less than 22  
B 22-24  
C 25-26  
D 27-30

Number indicates:  
Number of households with poor diets:

1 Less than 3,000  
2 3,000-11,999  
3 12,000-49,999  
4 50,000 or more

## NORTHEAST

### Connecticut

* Fairfield	A	3
Hartford	A	3
Litchfield	A	2
Middlesex	A	2
New Haven	A	3
New London	A	2
Tolland	A	2
Windham	A	2

### Maine

Androscoggin	A	2
Aroostook	A	2
Cumberland	A	2
Franklin	A	1
Hancock	A	1
Kennebec	A	2
Knox	A	1
Lincoln	A	1
Oxford	A	1
Penobscot	A	2
Piscataquis	A	1
Sagadahoc	A	1
Somerset	A	1
Waldo	A	1
Washington	A	1
York	A	2

### Massachusetts

* Barnstable	A	2
Berkshire	A	2
Bristol	A	3
* Dukes	A	1
Essex	A	3
Franklin	A	2
Hampden	A	3
Hampshire	A	2
Middlesex	A	4
* Nantucket	A	1
Norfolk	A	3
Plymouth	A	2
Suffolk	A	3
Worcester	A	3

### New Hampshire

Belknap	A	1
Carroll	A	1
Cheshire	A	1
Coos	A	1
Grafton	A	2
Hillsborough	A	2
Merrimack	A	2
Rockingham	A	2
Strafford	A	2
Sullivan	A	1

\* No food assistance program as of March 1, 1968.

\*\* Formal request for Food Stamp Program was made prior to March 1, 1968.

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTHEAST-continued

New Jersey

Atlantic	A	2
Bergen	A	3
Burlington	A	2
Camden	A	3
Cape May	A	2
Cumberland	A	2
Essex	A	3
Gloucester	A	2
Hudson	A	3
*Hunterdon	A	1
Mercer	A	3
Middlesex	A	3
Monmouth	A	3
*Morris	A	2
Ocean	A	2
Passaic	A	3
Salem	A	2
Somerset	A	2
Sussex	A	1
Union	A	3
Warren	A	2

New York

Albany	A	3
Allegany	A	1
Bronx	A	4
Broome	A	2
Cattaraugus	A	2
Cayuga	A	2
Chautauqua	A	2
Chemung	A	2
*Chenango	A	1
Clinton	A	2
Columbia	A	1
Cortland	A	1
Delaware	A	1
*Dutchess	A	2
Erie	A	4
Essex	A	1
Franklin	A	1
Fulton	A	2
Genesee	A	1

New York-continued

Greene	A	1
Hamilton	A	1
Herkimer	A	2
Jefferson	A	2
Kings	A	4
Lewis	A	1
Livingston	A	1
Madison	A	1
Monroe	A	3
Montgomery	A	2
Nassau	A	3
New York	A	4
Niagara	A	2
Oneida	A	3
Onondaga	A	3
*Ontario	A	2
*Orange	A	2
Orleans	A	1
Oswego	A	2
*Otsego	A	2
*Putnam	A	1
Queens	A	4
Rensselaer	A	2
Richmond	A	2
*Rockland	A	2
St. Lawrence	A	2
Saratoga	A	2
Schenectady	A	2
Schoharie	A	1
Schuyler	A	1
Seneca	A	1
Steuben	A	2
Suffolk	A	3
*Sullivan	A	1
Tioga	A	1
Tompkins	A	2
Ulster	A	2
Warren	A	1
Washington	A	1
Wayne	A	2
Westchester	A	3
Wyoming	A	1
Yates	A	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTHEAST-continued

Pennsylvania

Adams	A	1
Allegheny	A	4
Armstrong	A	2
Beaver	A	2
Bedford	A	1
Berks	A	3
Blair	A	2
Bradford	A	1
Bucks	A	3
Butler	A	2
Cambria	A	2
Cameron	A	1
Carbon	A	2
Centre	B	2
Chester	A	2
Clarion	A	1
Clearfield	A	2
Clinton	A	1
Columbia	A	2
Crawford	A	2
Cumberland	A	2
Dauphin	A	2
Delaware	A	3
Elk	A	1
Erie	A	3
Fayette	A	2
Forest	A	1
Franklin	A	2
Fulton	A	1
Greene	A	1
Huntingdon	A	1
Indiana	A	2
Jefferson	A	1
Juniata	A	1
Lackawanna	A	3
Lancaster	A	3
Lawrence	A	2
Lebanon	A	2
Lehigh	A	2
Luzerne	A	3
Lycoming	A	2
McKean	A	1
Mercer	A	2
Mifflin	A	1
Monroe	A	1
Montgomery	A	3
Montour	A	1

Pennsylvania-continued

Northampton	A	2
Northumberland	A	2
Perry	A	1
Philadelphia	A	4
*Pike	A	1
Potter	A	1
Schuylkill	A	2
Snyder	A	1
Somerset	A	2
Sullivan	A	1
Susquehanna	A	1
Tioga	A	1
Union	A	1
Venango	A	2
Warren	A	1
Washington	A	2
Wayne	A	1
Westmoreland	A	3
Wyoming	A	1
York	A	3

Rhode Island

Bristol	A	1
Kent	A	2
Newport	B	2
Providence	A	3
*Washington	A	2

Vermont

Addison	A	1
Bennington	A	1
Caledonia	A	1
Chittenden	A	2
Essex	A	1
Franklin	A	1
Grand Isle	A	1
Lamoille	A	1
*Orange	A	1
Orleans	A	1
Rutland	A	1
Washington	A	1
Windham	A	1
Windsor	A	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL

Illinois

Adams	B	2
Alexander	D	1
Bond	C	1
Boone	A	1
Brown	D	1
Bureau	B	1
Calhoun	C	1
Carroll	B	1
Cass	C	1
Champaign	C	2
Christian	B	1
Clark	C	1
Clay	B	1
Clinton	B	1
Coles	C	2
Cook	A	4
Crawford	B	1
Cumberland	C	1
De Kalb	B	2
De Witt	B	1
Douglas	B	1
Du Page	A	3
Edgar	C	1
Edwards	C	1
Effingham	B	1
Fayette	C	1
Ford	B	1
Franklin	C	2
Fulton	B	2
Gallatin	D	1
Greene	C	1
Grundy	A	1
Hamilton	D	1
Hancock	C	1
Hardin	C	1
Henderson	B	1
Henry	B	2
Iroquois	B	1
Jackson	D	2
Jasper	C	1
Jefferson	C	1
Jersey	B	1
Jo Daviess	B	1
Johnson	C	1
Kane	A	2

Illinois-continued

Kankakee	B	2
Kendall	A	1
Knox	B	2
Lake	A	3
La Salle	A	2
Lawrence	B	1
Lee	B	1
Livingston	B	1
Logan	B	1
McDonough	C	1
McHenry	A	2
McLean	B	2
Macon	A	2
Macoupin	B	2
Madison	A	3
Marion	B	2
Marshall	B	1
Mason	B	1
Massac	C	1
Menard	B	1
Mercer	B	1
Monroe	B	1
Montgomery	C	1
Morgan	C	1
Moultrie	B	1
Ogle	B	1
Peoria	A	3
Perry	C	1
Piatt	B	1
Pike	C	1
Pope	D	1
Pulaski	D	1
Putnam	B	1
Randolph	B	1
Richland	C	1
Rock Island	A	2
St. Clair	B	3
Saline	D	1
Sangamon	B	2
Schuyler	C	1
Scott	C	1
Shelby	C	1
Stark	B	1
Stephenson	B	2
Tazewell	A	2

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Illinois-continued

Union	C	1
Vermilion	B	2
Wabash	B	1
Warren	C	1
Washington	C	1
Wayne	C	1
White	C	1
Whiteside	B	2
Will	A	2
Williamson	C	2
Winnebago	A	3
Woodford	B	1

Indiana

Adams	B	1
Allen	A	3
Bartholomew	A	1
Benton	B	1
Blackford	B	1
Boone	B	1
Brown	B	1
Carroll	B	1
Cass	B	1
Clark	A	2
Clay	B	1
Clinton	B	1
Crawford	D	1
Daviess	C	1
Dearborn	A	1
Decatur	B	1
De Kalb	B	1
Delaware	B	2
Dubois	B	1
Elkhart	A	2
Fayette	B	1
Floyd	B	2
Fountain	B	1
Franklin	C	1
Fulton	B	1
Gibson	B	1
Grant	B	2
Greene	C	1
Hamilton	A	1
Hancock	A	1

Indiana-continued

Harrison	B	1
Hendricks	A	1
Henry	B	2
Howard	A	2
Huntington	B	1
Jackson	B	1
Jasper	C	1
Jay	B	1
Jefferson	C	1
Jennings	B	1
Johnson	A	1
Knox	B	2
Kosciusko	B	1
Lagrange	B	1
Lake	A	3
La Porte	A	2
Lawrence	B	1
Madison	A	2
Marion	A	3
Marshall	B	1
Martin	B	1
Miami	B	1
Monroe	C	2
Montgomery	B	1
Morgan	B	1
* Newton	B	1
Noble	B	1
Ohio	B	1
Orange	C	1
Owen	C	1
Parke	C	1
Perry	B	1
Pike	C	1
Porter	A	2
Posey	B	1
Pulaski	B	1
Putnam	C	1
Randolph	B	1
Ripley	B	1
Rush	B	1
St. Joseph	A	3
Scott	B	1
Shelby	B	1
Spencer	C	1
Starke	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Indiana-continued

*Steuben	C	1
Sullivan	C	1
Switzerland	C	1
Tippecanoe	B	2
Tipton	B	1
Union	B	1
Vanderburgh	B	2
Vermillion	B	1
Vigo	B	2
Wabash	B	1
Warren	B	1
Warrick	B	1
Washington	C	1
Wayne	B	2
Wells	B	1
*White	B	1
Whitley	B	1

Iowa

*Adair	C	1
Adams	C	1
*Allamakee	C	1
Appanoose	D	1
Audubon	C	1
Benton	B	1
Black Hawk	A	2
Boone	B	1
*Bremer	C	1
Buchanan	B	1
Buena Vista	C	1
Butler	B	1
Calhoun	B	1
Carroll	B	1
Cass	C	1
Cedar	B	1
Cerro Gordo	B	2
Cherokee	C	1
Chickasaw	C	1
Clark	C	1
Clay	B	1
Clayton	C	1
Clinton	B	2
Crawford	C	1
Dallas	B	1

Iowa-continued

Davis	C	1
Decatur	D	1
*Delaware	C	1
Des Moines	B	1
Dickinson	C	1
Dubuque	B	2
Emmet	B	1
*Fayette	C	1
Floyd	B	1
Franklin	C	1
Fremont	C	1
Greene	C	1
Grundy	B	1
Guthrie	C	1
Hamilton	B	1
Hancock	C	1
Hardin	B	1
Harrison	C	1
Henry	C	1
Howard	D	1
Humboldt	B	1
Ida	C	1
Iowa	B	1
Jackson	B	1
Jasper	B	1
Jefferson	C	1
Johnson	C	2
Jones	B	1
Keokuk	C	1
Kossuth	C	1
Lee	B	1
Linn	A	2
Louisa	B	1
Lucas	C	1
*Lyon	C	1
Madison	C	1
Mahaska	C	1
Marion	B	1
Marshall	B	1
*Mills	C	1
Mitchell	B	1
Monona	C	1
Monroe	C	1
Montgomery	C	1
Muscatine	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Iowa-continued

O'Brien	C	1
Osceola	C	1
*Page	C	1
Palo Alto	C	1
Plymouth	C	1
Pocahontas	B	1
Polk	A	3
Pottawattamie	B	2
*Poweshiek	C	1
Ringgold	D	1
Sac	C	1
Scott	A	2
Shelby	C	1
Sioux	C	1
Story	C	2
Tama	C	1
Taylor	D	1
Union	C	1
Van Buren	C	1
Wapello	B	2
Warren	B	1
Washington	C	1
Wayne	D	1
Webster	B	2
Winnebago	C	1
Winneshiek	D	1
Woodbury	B	2
*Worth	B	1
Wright	B	1

Kansas

*Allen	C	1
*Anderson	C	1
Atchison	C	1
*Barber	B	1
*Barton	B	1
Bourbon	D	1
*Brown	C	1
*Butler	B	1
*Chase	C	1
*Chautauqua	C	1
Cherokee	C	1
*Cheyenne	B	1
Clark	B	1

Kansas-continued

*Clay	C	1
*Cloud	C	1
*Coffey	C	1
*Comanche	C	1
*Cowley	B	1
Crawford	C	2
*Decatur	C	1
*Dickinson	B	1
*Doniphan	C	1
*Douglas	D	2
*Edwards	B	1
Elk	D	1
*Ellis	C	1
*Ellsworth	B	1
*Finney	B	1
Ford	B	1
*Franklin	C	1
*Geary	C	1
*Gove	B	1
*Graham	B	1
Grant	A	1
*Gray	B	1
*Greeley	A	1
Greenwood	C	1
Hamilton	B	1
Harper	B	1
*Harvey	B	1
*Haskell	A	1
Hodgeman	B	1
*Jackson	C	1
*Jefferson	B	1
*Jewell	C	1
*Johnson	A	2
Kearny	A	1
Kingman	B	1
*Kiowa	B	1
Labette	C	1
*Lane	B	1
*Leavenworth	B	1
*Lincoln	C	1
*Linn	C	1
*Logan	B	1
*Lyon	D	1
*McPherson	B	1
*Marion	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Kansas-continued

*Marshall	C	1
Meade	B	1
*Miami	B	1
*Mitchell	C	1
*Montgomery	C	2
*Morris	C	1
*Morton	A	1
*Nemaha	C	1
*Neosho	C	1
*Ness	B	1
*Norton	C	1
*Osage	C	1
*Osborne	C	1
*Ottawa	C	1
*Pawnee	B	1
*Phillips	C	1
*Pottawatomie	C	1
*Pratt	B	1
*Rawlins	B	1
*Reno	B	2
*Republic	D	1
*Rice	B	1
*Riley	D	1
*Rooks	B	1
*Rush	B	1
*Russell	B	1
*Saline	B	2
*Scott	B	1
Sedgwick	A	3
*Seward	A	1
Shawnee	B	2
*Sheridan	B	1
Sherman	B	1
*Smith	C	1
*Stafford	B	1
*Stanton	A	1
*Stevens	A	1
*Sumner	B	1
*Thomas	B	1
*Trego	B	1
*Wabaunsee	C	1
*Wallace	B	1
*Washington	C	1
*Wichita	B	1
Wilson	C	1
*Woodson	C	1
Wyandotte	B	3

Michigan

Alcona	B	1
Alger	B	1
Allegan	B	2
Alpena	B	1
Antrim	C	1
Arenac	B	1
Baraga	C	1
Barry	B	1
Bay	A	2
Benzie	B	1
Berrien	A	2
Branch	B	1
Calhoun	A	2
Cass	B	1
Charlevoix	B	1
Cheboygan	C	1
Chippewa	B	1
Clare	B	1
Clinton	A	1
Crawford	B	1
Delta	B	1
Dickinson	B	1
Eaton	A	1
Emmet	B	1
Genesee	A	3
Gladwin	B	1
Gogebic	C	1
Grand Traverse	B	1
Gratiot	B	1
Hillsdale	B	1
Houghton	C	1
Huron	C	1
Ingham	B	3
Ionia	B	1
Iosco	B	1
Iron	B	1
Isabella	C	1
Jackson	A	2
Kalamazoo	A	2
Kalkaska	C	1
Kent	A	3
Keweenaw	C	1
Lake	D	1
Lapeer	B	1
Leelanau	C	1
Lenawee	B	2
Livingston	A	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Michigan-continued

Luce	B	1
Mackinac	C	1
Macomb	A	3
Manistee	B	1
Marquette	B	2
Mason	B	1
Mecosta	D	1
Manominee	C	1
*Midland	A	1
Missaukee	C	1
Monroe	A	2
Montcalm	B	1
Montmorency	C	1
Muskegon	A	2
Newaygo	B	1
Oakland	A	3
Oceana	B	1
Ogemaw	C	1
Ontonagon	B	1
Osceola	B	1
Oscoda	B	1
Otsego	B	1
Ottawa	A	2
Presque Isle	B	1
Roscommon	B	1
Saginaw	A	2
St. Clair	B	2
St. Joseph	B	1
Sanilac	B	1
Schoolcraft	B	1
Shiawassee	B	2
Tuscola	B	1
Van Buren	B	2
Washtenaw	B	2
Wayne	A	4
Wexford	B	1

Minnesota

Aitkin	D	1
Anoka	A	2
Becker	C	1
Beltrami	C	1
Benton	B	1
Big Stone	D	1
Blue Earth	C	2
*Brown	C	1
Carlton	A	1
Carver	B	1
Cass	D	1
Chippewa	C	1
Chisago	B	1
*Clay	B	1
Clearwater	D	1
Cook	B	1
Cottonwood	C	1
Crow Wing	B	1
Dakota	A	2
*Dodge	C	1
Douglas	C	1
Faribault	C	1
*Fillmore	C	1
*Freeborn	B	1
*Goodhue	B	1
Grant	C	1
Hennepin	A	4
*Houston	B	1
Hubbard	C	1
Isanti	C	1
Itasca	B	1
Jackson	C	1
Kanabec	C	1
Kandiyohi	C	1
Kittson	C	1
Koochiching	A	1
Lac qui Parle	C	1
Lake	B	1
Lake of the Woods	C	1
Le Sueur	C	1
*Lincoln	C	1
Lyon	C	1
*McLeod	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Minnesota-continued

Mahnomen	C	1
Marshall	C	1
*Martin	C	1
Meeker	C	1
Mille Lacs	C	1
Morrison	C	1
Mower	A	1
Murray	C	1
Nicollet	B	1
Nobles	C	1
*Norman	C	1
*Olmsted	B	2
Otter Tail	C	2
Pennington	C	1
Pine	C	1
Pipestone	C	1
Polk	B	1
Pope	C	1
Ramsey	A	3
Red Lake	B	1
Redwood	C	1
Renville	C	1
*Rice	C	1
Rock	B	1
Roseau	C	1
St. Louis	B	3
Scott	B	1
Sherburne	B	1
Sibley	C	1
Stearns	C	2
*Steele	B	1
Stevens	C	1
Swift	C	1
Todd	D	1
Traverse	C	1
*Wabasha	B	1
Wadena	D	1
Waseca	C	1
Washington	A	1
*Watsonwan	C	1
*Wilkin	C	1
*Winona	C	1
Wright	B	1
Yellow Medicine	C	1

Missouri

*Adair	D	1
*Andrew	C	1
*Atchison	C	1
*Audrain	B	1
*Barry	D	1
*Barton	D	1
*Bates	D	1
*Benton	D	1
*Bollinger	D	1
*Boone	D	2
Buchanan	B	2
Butler	D	1
*Caldwell	D	1
*Callaway	C	1
*Camden	D	1
Cape Girardeau	C	2
*Carroll	C	1
Carter	D	1
*Cass	C	1
*Cedar	D	1
*Chariton	D	1
*Christian	C	1
*Clark	C	1
Clay	A	2
*Clinton	C	1
*Cole	B	1
*Cooper	C	1
*Crawford	C	1
*Dade	D	1
*Dallas	D	1
Daviess	D	1
De Kalb	D	1
*Dent	D	1
*Douglas	D	1
Dunklin	D	2
*Franklin	B	2
*Gasconade	C	1
Gentry	D	1
Greene	C	2
*Grundy	D	1
Harrison	D	1
*Henry	D	1
*Hickory	D	1
*Holt	C	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Missouri-continued

*Howard	D	1
*Howell	D	1
Iron	D	1
Jackson	B	3
*Jasper	C	2
Jefferson	A	2
*Johnson	D	1
*Knox	D	1
*Laclede	D	1
*Lafayette	C	1
*Lawrence	C	1
*Lewis	D	1
*Lincoln	C	1
Linn	D	1
Livingston	D	1
*McDonald	D	1
*Macon	D	1
Madison	C	1
*Maries	D	1
*Marion	C	1
Merçer	D	1
*Miller	C	1
Mississippi	D	1
*Moniteau	D	1
*Monroe	D	1
*Montgomery	C	1
*Morgan	D	1
New Madrid	D	1
*Newton	C	1
Nodaway	D	1
*Oregon	D	1
*Osage	C	1
*Ozark	D	1
Pemišcot	D	1
Perry	C	1
*Pettis	C	1
*Phelps	D	1
*Pike	C	1
*Platte	A	1
*Polk	D	1
*Pulaski	D	1
Putnam	D	1
*Ralls	C	1
*Randolph	C	1
*Ray	C	1

Missouri-continued

Reynolds	D	1
Ripley	D	1
St. Charles	A	1
*St. Clair	D	1
St. Francois	B	1
St. Louis	A	3
St. Louis City	B	4
*Ste. Genevieve	B	1
*Saline	C	1
*Schuyler	D	1
*Scotland	D	1
Scott	C	1
*Shannon	D	1
Shelby	D	1
Stoddard	D	1
*Stone	D	1
Sullivan	D	1
*Taney	D	1
*Texas	D	1
*Vernon	D	1
*Warren	B	1
Washington	C	1
Wayne	D	1
*Webster	D	1
*Worth	D	1
*Wright	D	1

Nebraska

*Adams	B	1
Antelope	C	1
Arthur	B	1
Banner	B	1
*Blaine	C	1
Boone	C	1
*Box Butte	B	1
Boyd	D	1
*Brown	C	1
Buffalo	C	1
*Burt	C	1
Butler	C	1
*Cass	B	1
Cedar	C	1
*Chase	C	1
*Cherry	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Nebraska-continued

*Cheyenne	A	1
Clay	C	1
*Colfax	C	1
Cuming	C	1
Custer	C	1
Dakota	B	1
*Dawes	C	1
Dawson	C	1
*Deuel	B	1
Dixon	C	1
Dodge	B	1
Douglas	A	3
*Dundy	C	1
*Fillmore	C	1
Franklin	C	1
*Frontier	C	1
*Furnas	C	1
Gage	C	1
*Garden	C	1
Garfield	C	1
Gosper	C	1
*Grant	C	1
Greeley	D	1
Hall	B	1
*Hamilton	C	1
Harlan	C	1
*Hayes	B	1
*Hitchcock	B	1
Holt	C	1
*Hooker	B	1
Howard	C	1
*Jefferson	C	1
*Johnson	C	1
Kearney	B	1
Keith	B	1
*Keya Paha	C	1
*Kimball	A	1
*Knox	C	1
Lancaster	B	2

Nebraska-continued

*Lincoln	B	1
*Logan	B	1
Loup	C	1
*McPherson	C	1
*Madison	C	1
Merrick	C	1
Morrill	B	1
*Nance	C	1
Nemaha	D	1
*Nuckolls	C	1
*Otoe	C	1
*Pawnee	D	1
*Perkins	B	1
Phelps	B	1
Pierce	C	1
*Platte	B	1
*Polk	C	1
*Redwillow	B	1
*Richardson	C	1
Rock	C	1
*Saline	C	1
Sarpy	B	1
Saunders	C	1
Scotts Bluff	B	1
*Seward	D	1
Sheridan	B	1
*Sherman	C	1
*Sioux	B	1
Stanton	C	1
*Thayer	C	1
*Thomas	C	1
*Thurston	C	1
*Valley	C	1
*Washington	C	1
*Wayne	D	1
*Webster	C	1
*Wheeler	C	1
York	C	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

North Dakota

*Adams	B	1
Barnes	C	1
*Benson	C	1
Billings	C	1
Bottineau	B	1
*Bowman	B	1
*Burke	C	1
Burleigh	B	1
Cass	B	2
Cavalier	C	1
Dickey	C	1
**Divide	C	1
Dunn	C	1
*Eddy	C	1
Emmons	C	1
Foster	B	1
Golden Valley	C	1
Grand Forks	B	2
*Grant	C	1
*Griggs	B	1
Hettinger	B	1
Kidder	C	1
La Moure	C	1
Logan	D	1
McHenry	C	1
McIntosh	D	1
*McKenzie	B	1
McLean	C	1
*Mercer	C	1
Morton	C	1
Mountrail	C	1
*Nelson	B	1
Oliver	D	1
Pembina	B	1
Pierce	C	1
Ramsey	B	1
Ransom	C	1
*Renville	B	1
Richland	C	1
Rolette	C	1
Sargent	C	1
Sheridan	D	1
**Sioux	D	1
*Slope	B	1
Stark	C	1

North Dakota-continued

Steele	B	1
*Stutsman	C	1
Towner	B	1
Traill	B	1
Walsh	B	1
Ward	B	2
*Wells	C	1
Williams	B	1

Ohio

Adams	D	1
Allen	B	2
Ashland	B	1
Ashtabula	B	2
Athens	D	2
*Auglaize	B	1
Belmont	B	2
Brown	C	1
Butler	A	2
Carroll	B	1
Champaign	B	1
Clark	B	2
Clermont	A	2
Clinton	B	1
Columbiana	B	2
Coshocton	B	1
Crawford	B	2
Cuyahoga	A	4
Darke	B	2
*Defiance	B	1
Delaware	B	1
Erie	A	2
*Fairfield	B	2
Fayette	C	1
Franklin	B	3
Fulton	B	1
Gallia	C	1
Geauga	A	1
Greene	A	2
Guernsey	B	1
Hamilton	A	4
*Hancock	B	2
Hardin	C	1
Harrison	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

Ohio-continued

*Henry	B	1
Highland	C	1
Hocking	B	1
Holmes	B	1
Huron	A	1
Jackson	C	1
Jefferson	A	2
Knox	B	1
Lake	A	2
Lawrence	B	2
Licking	B	2
Logan	B	1
Lorain	A	3
Lucas	A	3
Madison	B	1
Mahoning	A	3
Marion	B	2
Medina	A	2
Meigs	C	1
*Mercer	B	1
Miami	A	2
Monroe	C	1
Montgomery	A	3
Morgan	C	1
Morrow	B	1
Muskingum	B	2
Noble	C	1
Ottawa	A	1
*Paulding	B	1
Perry	B	1
Pickaway	B	1
Pike	C	1
Portage	B	2
Preble	B	1
*Putnam	B	1
Richland	A	2
Ross	B	2
Sandusky	A	2
Scioto	B	2
*Seneca	B	2
Shelby	B	1
Stark	A	3
Summit	A	3
Trumbull	A	2
Tuscarawas	B	2

Ohio-continued

Union	B	1
Van Wert	B	1
Vinton	C	1
Warren	A	2
Washington	B	2
Wayne	B	2
*Williams	B	1
Wood	B	2
Wyandot	B	1

South Dakota

Aurora	D	1
Beadle	C	1
Bennett	C	1
*Bon Homme	D	1
*Brookings	D	1
Brown	C	1
Brule	C	1
Buffalo	D	1
*Butte	B	1
*Campbell	C	1
**Charles Mix	D	1
Clark	D	1
*Clay	D	1
Codington	B	1
Corson	D	1
*Custer	B	1
Davison	C	1
*Day	C	1
*Deuel	C	1
**Dewey	C	1
**Douglas	D	1
Edmunds	C	1
*Fall River	B	1
Faulk	D	1
Grant	D	1
*Gregory	C	1
*Haakon	B	1
*Hamlin	D	1
Hand	C	1
Hanson	D	1
*Harding	B	1
*Hughes	A	1
Hutchinson	D	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

South Dakota-continued

Wisconsin

Hyde	D	1
Jackson	B	1
Jerauld	D	1
*Jones	C	1
*Kingsbury	C	1
*Lake	C	1
*Lawrence	B	1
**Lincoln	C	1
Lyman	B	1
McCook	C	1
McPherson	D	1
Marshall	C	1
*Meade	C	1
Mellette	D	1
Miner	D	1
*Minnehaha	B	2
Moody	D	1
Pennington	B	2
Perkins	B	1
Potter	C	1
Roberts	D	1
Sanborn	C	1
*Shannon	D	1
Spink	C	1
*Stanley	A	1
*Sully	B	1
Todd	D	1
Tripp	B	1
Turner	D	1
Union	C	1
Walworth	B	1
*Washabaugh	C	1
*Yankton	D	1
*Ziebach	B	1

Adams	C	1
Ashland	C	1
Barron	C	1
Bayfield	C	1
Brown	A	2
Buffalo	B	1
Burnett	C	1
*Calumet	A	1
*Chippewa	B	1
Clark	C	1
Columbia	B	1
Crawford	C	1
Dane	B	3
Dodge	B	2
Door	B	1
Douglas	B	2
Dunn	C	1
Eau Claire	B	2
Florence	B	1
Fond du Lac	B	2
Forest	C	1
Grant	C	2
Green	B	1
*Green Lake	B	1
*Iowa	C	1
Iron	B	1
Jackson	C	1
*Jefferson	B	2
Juneau	C	1
Kenosha	A	2
Kewaunee	B	1
La Crosse	B	2
Lafayette	B	1
Langlade	C	1

POOR DIETS IN COUNTIES, Spring 1965-continued

NORTH CENTRAL-continued

# Wisconsin-continued

Lincoln	B	1
Manitowoc	B	2
Marathon	B	2
Marinette	B	1
*Marquette	C	1
Milwaukee	A	4
Monroe	B	1
Oconto	C	1
Oneida	B	1
Outagamie	A	2
Ozaukee	A	1
Pepin	C	1
Pierce	C	1
Polk	C	1
Portage	B	1
Price	C	1
Racine	A	2
Richland	C	1
Rock	A	2
Rusk	C	1
St. Croix	B	1
Sauk	B	1
Sawyer	C	1
Shawano	C	1
Sheboygan	B	2
Taylor	C	1
Trempealeau	C	1
Vernon	C	1
*Vilas	C	1
*Walworth	B	2
Washburn	C	1
Washington	A	1
Waukesha	A	2
Waupaca	B	1
Waushara	C	1
Winnebago	A	2
Wood	B	2

# Data not available for classifying Menominee County.

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH

Alabama

Autauga	D	1
Baldwin	C	2
Barbour	D	1
Bibb	D	1
Blount	C	1
Bullock	D	1
Butler	D	1
Calhoun	B	2
*Chambers	C	1
Cherokee	C	1
Chilton	D	1
Choctaw	D	1
Clarke	D	1
Clay	C	1
Cleburne	C	1
Coffee	D	1
Colbert	B	2
Conecuh	D	1
Coosa	C	1
Covington	C	1
Crenshaw	D	1
Cullman	D	2
Dale	C	1
Dallas	D	2
De Kalb	D	2
Elmore	C	1
Escambia	C	1
Etowah	B	2
Fayette	D	1
Franklin	D	1
Geneva	D	1
Greene	D	1
Hale	D	1
Henry	D	1
Houston	C	2
Jackson	D	1
Jefferson	B	3
Lamar	C	1
Lauderdale	B	2
Lawrence	D	1
Lee	D	2
Limestone	C	1
Lowndes	D	1
Macon	D	1
Madison	B	2

Alabama-continued

Marengo	D	1
Marion	D	1
Marshall	C	2
Mobile	B	3
Monroe	D	1
Montgomery	C	2
*Morgan	B	2
Perry	D	1
Pickens	D	1
Pike	D	1
Randolph	D	1
Russell	C	2
St. Clair	C	1
Shelby	C	1
Sumter	D	1
Talladega	C	2
Tallapoosa	C	1
*Tuscaloosa	C	2
Walker	C	2
Washington	C	1
Wilcox	D	1
Winston	D	1

Arkansas

Arkansas	C	1
Ashley	C	1
Baxter	C	1
Benton	C	2
Boone	D	1
Bradley	D	1
Calhoun	D	1
Carroll	D	1
Chicot	D	1
Clark	D	1
Clay	D	1
Cleburne	D	1
Cleveland	D	1
Columbia	D	1
Conway	D	1
Craighead	D	2
Crawford	C	1
Crittenden	D	2
Cross	D	1
Dallas	D	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Arkansas-continued

Desha	D	1
Drew	D	1
Faulkner	D	1
Franklin	D	1
Fulton	D	1
Garland	D	2
Grant	C	1
Greene	D	1
Hempstead	D	1
Hot Spring	C	1
Howard	C	1
Independence	D	1
Izard	D	1
Jackson	D	1
Jefferson	D	2
Johnson	D	1
Lafayette	D	1
Lawrence	D	1
Lee	D	1
Lincoln	D	1
Little River	D	1
Logan	D	1
Lonoke	D	1
Madison	D	1
Marion	D	1
Miller	D	1
Mississippi	D	2
Monroe	D	1
Montgomery	D	1
Nevada	D	1
Newton	D	1
Ouachita	C	1
Perry	D	1
Phillips	D	2
Pike	D	1
Poinsett	D	1
Polk	D	1
Pope	D	1
Prairie	D	1
Pulaski	B	3
Randolph	D	1
St. Francis	D	1
Saline	B	1
Scott	D	1
Searcy	D	1

Arkansas-continued

Sebastian	C	2
Sevier	D	1
Sharp	D	1
Stone	D	1
Union	B	2
Van Buren	D	1
Washington	D	2
White	D	1
Woodruff	D	1
Yell	D	1

Delaware

Kent	B	2
New Castle	A	3
Sussex	B	2

District of Columbia	B	4
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Florida

* Alachua	D	2
Baker	C	1
Bay	C	2
Bradford	C	1
* Brevard	A	2
Broward	B	3
* Calhoun	D	1
* Charlotte	C	1
* Citrus	C	1
* Clay	C	1
* Collier	B	1
* Columbia	C	1
Dade	B	4
* De Soto	D	1
Dixie	C	1
Duval	B	3
Escambia	B	3
* Flagler	D	1
* Franklin	D	1
Gadsden	D	1
* Gilchrist	D	1
* Glades	D	1
Gulf	B	1
* Hamilton	D	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Florida-continued

Hardee	C	1
*Hendry	C	1
*Hernando	C	1
Highlands	C	1
Hillsborough	B	3
*Holmes	D	1
*Indian River	B	1
*Jackson	D	1
*Jefferson	D	1
Lafayette	C	1
Lake	C	2
Lee	C	2
Leon	C	2
*Levy	D	1
*Liberty	C	1
*Madison	D	1
*Manatee	C	2
*Marion	C	2
*Martin	B	1
Monroe	C	2
*Nassau	B	1
*Okaloosa	B	2
Okeechobee	B	1
*Orange	B	3
*Osceola	D	1
Palm Beach	C	3
Pasco	D	2
Pinellas	C	3
Polk	B	3
*Putnam	C	1
*St. Johns	C	1
St. Lucie	C	2
Santa Rosa	C	1
*Sarasota	B	2
*Seminole	B	2
*Sumter	C	1
*Suwannee	D	1
Taylor	C	1
Union	C	1
*Volusia	C	3
*Wakulla	D	1
*Walton	D	1
*Washington	D	1

Georgia

Appling	D	1
Atkinson	D	1
Bacon	D	1
Baker	D	1
Baldwin	C	1
Banks	C	1
Barrow	C	1
Bartow	C	1
*Ben Hill	D	1
Berrien	D	1
Bibb	B	2
Bleckley	D	1
Brantley	C	1
Brooks	D	1
Bryan	C	1
*Bulloch	D	1
Burke	D	1
Butts	D	1
Calhoun	D	1
Camden	B	1
Candler	D	1
Carroll	C	1
Catoosa	B	1
Charlton	C	1
Chatham	B	3
Chattahoochee	D	1
Chattooga	B	1
Cherokee	C	1
Clarke	D	2
Clay	D	1
Clayton	A	1
Clinch	D	1
Cobb	A	2
Coffee	D	1
Colquitt	D	1
*Columbia	B	1
Cook	D	1
Coweta	C	1
*Crawford	D	1
Crisp	D	1
Dade	C	1
Dawson	D	1
*Decatur	D	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Georgia-continued

De Kalb	A	3
Dodge	D	1
Dooly	D	1
Dougherty	C	2
Douglas	B	1
Early	D	1
Echols	D	1
*Effingham	C	1
Elbert	C	1
Emanuel	D	1
Evans	D	1
Fannin	C	1
Fayette	B	1
Floyd	B	2
Forsyth	C	1
*Franklin	C	1
Fulton	B	3
Gilmer	D	1
*Glascocock	D	1
Glynn	B	1
Gordon	C	1
Grady	D	1
Greene	D	1
Gwinnett	B	1
Habersham	C	1
Hall	B	2
Hancock	D	1
Haralson	C	1
*Harris	C	1
Hart	C	1
Heard	D	1
Henry	B	1
Houston	A	1
Irwin	D	1
Jackson	C	1
**Jasper	D	1
Jeff Davis	C	1
Jefferson	D	1
**Jenkins	D	1
*Johnson	C	1
**Jones	C	1
Lamar	C	1
Lanier	D	1
**Laurens	D	1
Lee	D	1

Georgia-continued

Liberty	D	1
*Lincoln	D	1
Long	D	1
Lowndes	C	2
Lumpkin	D	1
McDuffie	D	1
McIntosh	D	1
Macon	D	1
Madison	D	1
Marion	D	1
Meriwether	D	1
Miller	D	1
Mitchell	D	1
Monroe	D	1
*Montgomery	D	1
Morgan	D	1
*Murray	C	1
Muscogee	C	2
Newton	C	1
**Oconee	C	1
Oglethorpe	D	1
Paulding	B	1
Peach	D	1
Pickens	C	1
Pierce	D	1
Pike	D	1
Polk	C	1
Pulaski	D	1
Putnam	D	1
Quitman	D	1
Rabun	C	1
Randolph	D	1
Richmond	C	2
Rockdale	B	1
*Schley	D	1
Screven	D	1
Seminole	D	1
Spalding	B	1
Stephens	C	1
Stewart	D	1
*Sumter	D	1
*Talbot	D	1
Taliaferro	D	1
Tattnall	D	1
Taylor	D	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Georgia-continued

Telfair	D	1
Terrell	D	1
Thomas	D	1
Tift	D	1
Toombs	D	1
Towns	D	1
Treutlen	D	1
*Troup	C	2
Turner	D	1
Twiggs	C	1
*Union	D	1
Upton	B	1
Walker	B	1
Walton	C	1
Ware	B	1
*Warren	D	1
Washington	D	1
Wayne	C	1
*Webster	D	1
Wheeler	D	1
White	C	1
Whitfield	B	1
Wilcox	D	1
*Wilkes	D	1
Wilkinson	C	1
Worth	D	1

Kentucky

Adair	D	1
Allen	D	1
Anderson	C	1
Ballard	C	1
Barren	D	1
Bath	D	1
Bell	D	1
Boone	A	1
*Bourbon	C	1
Boyd	B	2
Boyle	C	1
Bracken	C	1
Breathitt	D	1
Breckinridge	D	1
Bullitt	B	1
Butler	D	1
Caldwell	D	1
Calloway	D	1
Campbell	A	2
Carlisle	C	1

Kentucky-continued

Carroll	C	1
Carter	C	1
Casey	D	1
Christian	D	2
Clark	C	1
Clay	D	1
Clinton	D	1
Crittenden	D	1
Cumberland	D	1
Daviess	B	2
Edmonson	D	1
Elliott	D	1
Estill	D	1
Fayette	B	2
Fleming	D	1
Floyd	C	1
Franklin	B	1
Fulton	D	1
*Gallatin	C	1
Garrard	C	1
Grant	C	1
Graves	C	1
Grayson	D	1
Green	C	1
Greenup	B	1
Hancock	C	1
Hardin	D	2
Harlan	C	2
*Harrison	C	1
Hart	D	1
Henderson	C	1
Henry	C	1
Hickman	C	1
Hopkins	C	1
Jackson	D	1
Jefferson	A	3
Jessamine	D	1
Johnson	D	1
Kenton	A	2
Knott	D	1
Knox	D	1
Larue	C	1
Laurel	D	1
Lawrence	D	1
Lee	D	1
Leslie	D	1
Letcher	D	1
Lewis	C	1
Lincoln	D	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Kentucky-continued

Livingston	C	1
Logan	D	1
Lyon	C	1
McCracken	B	2
McCreary	D	1
McLean	C	1
Madison	D	1
Magoffin	D	1
Marion	D	1
Marshall	B	1
Martin	D	1
Mason	C	1
Meade	B	1
Menifee	D	1
Mercer	C	1
Metcalfe	D	1
Monroe	D	1
Montgomery	C	1
Morgan	D	1
Muhlenberg	C	1
Nelson	C	1
*Nicholas	D	1
Ohio	D	1
Oldham	B	1
Owen	C	1
Owsley	D	1
Pendleton	C	1
Perry	D	1
Pike	D	2
Powell	D	1
Pulaski	D	1
Robertson	D	1
Rockcastle	D	1
Rowan	D	1
Russell	D	1
Scott	C	1
Shelby	B	1
Simpson	D	1
Spencer	C	1
Taylor	C	1
Todd	D	1
Trigg	D	1
Trimble	C	1
Union	C	1
Warren	D	2
Washington	D	1
Wayne	D	1
Webster	D	1
Whitley	D	1
Wolfe	D	1
*Woodford	B	1

Louisiana

Acadia	D	2
Allen	C	1
Ascension	C	1
Assumption	D	1
Avoyelles	D	2
Beauregard	D	1
*Bienville	D	1
*Bossier	B	2
Caddo	B	3
Calcasieu	B	2
Caldwell	D	1
Cameron	B	1
Catahoula	D	1
*Claiborne	D	1
Concordia	D	1
De Soto	D	1
East Baton Rouge	B	3
East Carroll	D	1
*East Feliciana	D	1
Evangeline	D	1
Franklin	D	1
Grant	D	1
Iberia	B	2
Iberville	D	1
*Jackson	C	1
*Jefferson	A	2
Jefferson Davis	C	1
Lafayette	C	2
*Lafourche	B	2
La Salle	C	1
*Lincoln	D	1
*Livingston	C	1
Madison	D	1
*Morehouse	D	1
Natchitoches	D	1
Orleans	C	4
Ouachita	C	2
*Plaquemines	B	1
Pointe Coupee	D	1
Rapides	C	2
Red River	D	1
Richland	D	1
**Sabine	D	1
St. Bernard	A	1
St. Charles	A	1
St. Helena	D	1
St. James	C	1
St. John		
the Baptist	C	1
St. Landry	D	2
St. Martin	D	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Louisiana-continued

St. Mary	B	2
St. Tammany	C	1
*Tangipahoa	D	2
Tensas	D	1
*Terrebonne	B	2
Union	D	1
Vermilion	C	1
Vernon	D	1
Washington	C	2
*Webster	C	2
*West Baton Rouge	C	1
West Carroll	D	1
*West Feliciana	D	1
Winn	D	1

Maryland

Allegany	B	2
Anne Arundel	A	2
Baltimore	A	3
Baltimore city	B	4
*Calvert	B	1
Caroline	C	1
Carroll	B	2
*Cecil	B	2
Charles	A	1
Dorchester	C	1
Frederick	B	2
Garrett	C	1
Harford	B	2
*Howard	A	1
Kent	C	1
Montgomery	A	3
Prince Georges	A	3
Queen Annes	C	1
St. Marys	C	1
Somerset	D	1
Talbot	B	1
*Washington	B	2
Wicomico	B	2
Worcester	C	1

Mississippi

Adams	C	1
Alcorn	D	1
Amite	D	1
Attala	D	1
Benton	D	1
Bolivar	D	2
Calhoun	D	1
Carroll	D	1
Chickasaw	D	1
Choctaw	D	1
Claiborne	D	1
Clarke	D	1
Clay	D	1
Coahoma	D	2
Copiah	D	1
Covington	D	1
De Soto	D	1
Forrest	D	2
Franklin	D	1
George	C	1
Greene	D	1
Grenada	D	1
Hancock	D	1
Harrison	C	2
Hinds	B	3
Holmes	D	1
Humphreys	D	1
Issaquena	D	1
Itawamba	D	1
Jackson	B	2
Jasper	D	1
Jefferson	D	1
Jefferson Davis	D	1
Jones	C	2
Kemper	D	1
Lafayette	D	1
Lamar	C	1
Lauderdale	C	2
Lawrence	D	1
Leake	D	1
Lee	C	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Mississippi-continued

Leflore	D	2
Lincoln	C	1
Lowndes	D	2
Madison	D	1
Marion	D	1
Marshall	D	1
Monroe	D	1
Montgomery	D	1
Neshoba	D	1
Newton	D	1
Noxubee	D	1
Oktibbeha	D	1
Panola	D	1
Pearl River	C	1
Perry	D	1
Pike	D	1
Pontotoc	D	1
Prentiss	D	1
Quitman	D	1
Rankin	C	1
Scott	D	1
Sharkey	D	1
Simpson	D	1
Smith	D	1
Stone	D	1
Sunflower	D	2
Tallahatchie	D	1
Tate	D	1
Tippah	D	1
Tishomingo	D	1
Tunica	D	1
Union	D	1
Walthall	D	1
Warren	D	2
Washington	D	2
Wayne	D	1
Webster	D	1
Wilkinson	D	1
Winston	D	1
Yalobusha	D	1
Yazoo	D	1

North Carolina

Alamance	B	2
Alexander	B	1
Alleghany	C	1
Anson	D	1
Ashe	D	1
Avery	D	1
Beaufort	D	1
Bertie	D	1
Bladen	D	1
Brunswick	D	1
*Buncombe	B	2
Burke	B	2
Cabarrus	B	2
Caldwell	B	2
Camden	D	1
Carteret	C	1
*Caswell	C	1
*Catawba	B	2
Chatham	C	1
Cherokee	D	1
Chowan	D	1
Clay	D	1
Cleveland	C	2
Columbus	D	2
Craven	C	2
Cumberland	D	2
Currituck	C	1
Dare	C	1
Davidson	B	2
Davie	B	1
*Duplin	D	1
Durham	C	2
Edgecombe	D	2
Forsyth	B	3
Franklin	D	1
Gaston	B	2
Gates	D	1
Graham	D	1
Granville	D	1
Greene	D	1
Guilford	B	3

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

North Carolina-continued

Halifax	D	2
Harnett	D	2
Haywood	B	1
Henderson	B	1
Hertford	D	1
Hoke	D	1
Hyde	D	1
*Iredell	B	2
Jackson	D	1
Johnston	D	2
Jones	D	1
Lee	B	1
Lenoir	D	2
*Lincoln	B	1
McDowell	B	1
Macon	D	1
Madison	D	1
Martin	D	1
Mecklenburg	B	3
Mitchell	D	1
Montgomery	C	1
Moore	C	1
*Nash	D	2
New Hanover	C	2
Northampton	D	1
Onslow	D	2
Orange	D	2
Pamlico	C	1
Pasquotank	C	1
Pender	D	1
Perquimans	D	1
Person	C	1
Pitt	D	2
*Polk	C	1
*Randolph	B	2
Richmond	C	1
Robeson	D	2
Rockingham	B	2
Rowan	B	2
Rutherford	C	2
*Sampson	D	2
Scotland	D	1
*Stanly	B	1
*Stokes	C	1
Surry	C	2
Swain	D	1

North Carolina-continued

Transylvania	B	1
Tyrrell	D	1
Union	C	2
Vance	D	1
Wake	B	2
Warren	D	1
Washington	C	1
Watauga	D	1
Wayne	D	2
Wilkes	C	2
Wilson	D	2
Yadkin	B	1
Yancey	D	1

Oklahoma

Adair	D	1
Alfalfa	B	1
Atoka	D	1
*Beaver	B	1
Beckham	C	1
Blaine	C	1
Bryan	D	1
Caddo	C	1
Canadian	B	1
Carter	C	2
Cherokee	D	1
Choctaw	D	1
Cimarron	A	1
Cleveland	C	2
Coal	D	1
Comanche	C	2
Cotton	D	1
Craig	C	1
Creek	C	2
Custer	C	1
Delaware	D	1
Dewey	C	1
Ellis	B	1
Garfield	B	2
Garvin	B	1
Grady	C	1
Grant	B	1
Greer	C	1
*Harmon	C	1
Harper	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Oklahoma-continued

Haskell	D	1
Hughes	D	1
Jackson	C	1
Jefferson	D	1
Johnston	D	1
Kay	B	2
Kingfisher	B	1
Kiowa	C	1
Latimer	D	1
Le Flore	D	1
Lincoln	C	1
Logan	D	1
Love	D	1
McClain	C	1
McCurtain	D	1
McIntosh	D	1
*Major	C	1
Marshall	C	1
Mayes	C	1
Murray	D	1
Muskogee	C	2
Noble	C	1
Nowata	B	1
Okfuskee	D	1
Oklahoma	B	3
Okmulgee	C	2
Osage	B	1
Ottawa	C	1
Pawnee	C	1
Payne	D	2
Pittsburg	D	2
Pontotoc	C	1
Pottawatomie	C	2
Pushmataha	D	1
Roger Mills	C	1
Rogers	C	1
Seminole	C	1
Sequoyah	D	1
Stephens	B	1
Texas	B	1
Tillman	C	1
Tulsa	A	3
Wagoner	C	1
Washington	A	1
Washita	C	1
*Woods	C	1
Woodward	B	1

South Carolina

Abbeville	C	1
*Aiken	B	2
*Allendale	D	1
*Anderson	B	2
*Bamberg	D	1
*Barnwell	D	1
Beaufort	D	1
*Berkeley	C	1
*Calhoun	D	1
*Charleston	C	3
*Cherokee	C	1
*Chester	C	1
Chesterfield	D	1
*Clarendon	D	1
*Colleton	D	1
Darlington	C	2
Dillon	D	1
*Dorchester	C	1
Edgefield	D	1
*Fairfield	D	1
Florence	C	2
*Georgetown	C	1
*Greenville	B	3
*Greenwood	C	2
*Hampton	D	1
*Horry	D	2
Jasper	D	1
*Kershaw	C	1
*Lancaster	B	1
Laurens	C	2
Lee	D	1
*Lexington	B	2
McCormick	D	1
Marion	D	1
Marlboro	D	1
*Newberry	D	1
*Oconee	D	1
*Orangeburg	D	2
*Pickens	B	2
*Richland	D	3
*Saluda	C	1
*Spartanburg	B	2
Sumter	D	2
Union	B	1
Williamsburg	D	1
York	B	2

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Tennessee

Anderson	A	2
Bedford	C	1
Benton	C	1
Bledsoe	D	1
Blount	B	2
**Bradley	C	1
Campbell	D	1
Cannon	C	1
Carroll	D	1
Carter	B	1
Cheatham	C	1
Chester	D	1
Claiborne	D	1
Clay	D	1
Cocke	D	1
Coffee	B	1
Crockett	D	1
Cumberland	D	1
Davidson	B	3
Decatur	D	1
De Kalb	D	1
Dickson	C	1
Dyer	D	1
Fayette	D	1
Fentress	D	1
Franklin	C	1
Gibson	D	2
Giles	D	1
Grainger	D	1
Greene	C	2
Grundy	D	1
Hamblen	B	1
Hamilton	B	3
Hancock	D	1
Hardeman	D	1
Hardin	D	1
Hawkins	D	1
Haywood	D	1
Henderson	D	1
Henry	D	1
Hickman	C	1
Houston	D	1
Humphreys	C	1
Jackson	D	1
*Jefferson	C	1
Johnson	D	1
Knox	B	3
Lake	D	1

Tennessee-continued

Lauderdale	D	1
Lawrence	C	1
*Lewis	C	1
Lincoln	D	1
Loudon	B	1
McMinn	C	1
McNairy	D	1
Macon	D	1
Madison	D	2
Marion	C	1
*Marshall	C	1
*Maury	C	2
Meigs	D	1
Monroe	D	1
Montgomery	D	2
Moore	C	1
Morgan	D	1
Obion	C	1
Overton	D	1
Perry	D	1
Pickett	D	1
Polk	B	1
Putnam	D	1
Rhea	D	1
Roane	B	1
Robertson	C	1
Rutherford	C	2
Scott	D	1
Sequatchie	C	1
Sevier	C	1
Shelby	B	3
Smith	D	1
Stewart	D	1
Sullivan	B	2
Sumner	C	1
Tipton	D	1
Trousdale	D	1
Unicoi	B	1
Union	D	1
Van Buren	D	1
Warren	C	1
Washington	C	2
Wayne	D	1
Weakley	D	1
White	D	1
*Williamson	C	1
Wilson	C	1

POOR DIETS IN COUNTIES, Spring 1965--continued

SOUTH--continued

Texas

Anderson	C	1
*Andrews	A	1
Angelina	B	1
*Aransas	C	1
*Archer	B	1
*Armstrong	B	1
Atascosa	C	1
Austin	D	1
*Bailey	B	1
*Bandera	C	1
*Bastrop	D	1
*Baylor	C	1
Bee	C	1
*Bell	C	2
Bexar	C	3
*Blanco	C	1
*Borden	A	1
*Bosque	D	1
*Bowie	C	2
*Brazoria	A	2
*Brazos	D	2
Brewster	D	1
*Briscoe	B	1
Brooks	C	1
Brown	D	1
Burleson	D	1
*Burnet	C	1
Caldwell	D	1
*Calhoun	B	1
Callahan	C	1
Cameron	D	2
Camp	D	1
Carson	A	1
*Cass	C	1
*Castro	B	1
*Chambers	A	1
*Cherokee	D	1
Childress	C	1
*Clay	B	1
Cochran	B	1
Coke	B	1
*Coleman	D	1
*Collin	C	2
*Collingsworth	C	1
*Colorado	C	1

Texas--continued

*Comal	B	1
*Comanche	D	1
*Concho	C	1
Cooke	C	1
*Coryell	D	1
Cottle	C	1
*Crane	A	1
*Crockett	A	1
Crosby	B	1
Culberson	B	1
Dallam	B	1
Dallas	A	4
Dawson	B	1
*Deaf Smith	B	1
Delta	D	1
*Denton	D	2
*De Witt	D	1
Dickens	C	1
Dimmit	D	1
*Donley	C	1
Duval	D	1
Eastland	D	1
*Ector	A	2
*Edwards	C	1
*Ellis	C	2
El Paso	B	3
*Erath	D	1
*Falls	D	1
*Fannin	D	1
Fayette	D	1
Fisher	C	1
Floyd	B	1
Foard	C	1
*Fort Bend	C	1
Franklin	D	1
*Freestone	D	1
Frio	D	1
*Gaines	A	1
Galveston	B	2
*Garza	B	1
*Gillespie	C	1
*Glasscock	A	1
*Goliad	D	1
*Gonzales	D	1
*Gray	A	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

# Texas-continued

*Grayson	C	2
*Gregg	B	2
*Grimes	D	1
Guadalupe	C	1
Hale	B	1
*Hall	C	1
Hamilton	D	1
*Hansford	A	1
Hardeman	C	1
Hardin	B	1
Harris	A	4
*Harrison	C	2
*Hartley	A	1
Haskell	C	1
Hays	D	1
Hemphill	B	1
Henderson	D	1
Hidalgo	D	2
*Hill	D	1
Hockley	B	1
*Hood	C	1
*Hopkins	D	1
Houston	D	1
Howard	B	1
Hudspeth	B	1
*Hunt	C	2
Hutchinson	A	1
Irion	B	1
*Jack	B	1
Jackson	B	1
Jasper	C	1
Jeff Davis	C	1
Jefferson	A	3
Jim Hogg	D	1
Jim Wells	C	1
*Johnson	B	1
Jones	C	1
*Karnes	D	1
*Kaufman	C	1
*Kendall	C	1
*Kenedy	D	1
Kent	B	1
*Kerr	C	1
*Kimble	C	1

Texas-continued

*King	C	1
Kinney	C	1
Kleberg	D	1
Knox	C	1
*Lamar	D	2
Lamb	B	1
*Lampasas	C	1
La Salle	D	1
*Lavaca	D	1
*Lee	D	1
*Leon	D	1
Liberty	C	1
*Limestone	D	1
Lipscomb	B	1
*Live Oak	C	1
*Llano	C	1
Lubbock	B	2
*Lynn	B	1
*McCulloch	C	1
McLennan	C	2
*McMullen	B	1
*Madison	D	1
Marion	D	1
Martin	A	1
*Mason	C	1
Matagorda	C	1
Maverick	D	1
Medina	C	1
*Menard	C	1
*Midland	A	2
Milam	D	1
*Mills	D	1
*Mitchell	C	1
Montague	C	1
*Montgomery	C	1
Moore	A	1
Morris	B	1
Motley	C	1
*Nacogdoches	D	1
*Navarro	D	2
Newton	D	1
Nolan	B	1
Nueces	B	3
*Ochiltree	A	1
*Oldham	B	1

# Texas - Data not available for classifying Loving County.

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Texas-continued

Orange	A	2
*Palo Pinto	C	1
Panola	C	1
*Parker	C	1
*Parmer	B	1
Pecos	B	1
Polk	D	1
Potter	B	2
Presidio	C	1
Rains	D	1
*Randall	A	1
*Reagan	A	1
Real	D	1
Red River	D	1
*Reeves	C	1
*Refugio	B	1
*Roberts	B	1
*Robertson	D	1
*Rockwall	C	1
*Runnels	C	1
*Rusk	C	1
Sabine	D	1
San Augustine	D	1
San Jacinto	D	1
San Patricio	C	1
*San Saba	C	1
*Schleicher	A	1
Scurry	A	1
*Shackelford	B	1
Shelby	D	1
*Sherman	A	1
Smith	B	2
*Somervell	D	1
Starr	D	1
*Stephens	B	1
*Sterling	B	1
Stonewall	B	1

Texas-continued

*Sutton	B	1
Swisher	B	1
Tarrant	B	3
*Taylor	B	2
Terrell	B	1
Terry	B	1
*Throckmorton	B	1
Titus	C	1
Tom Green	C	2
Travis	C	3
Trinity	D	1
*Tyler	D	1
Upshur	C	1
*Upton	A	1
*Uvalde	C	1
*Val Verde	C	1
*Van Zandt	C	1
*Victoria	B	2
Walker	D	1
*Waller	D	1
*Ward	A	1
*Washington	D	1
Webb	D	2
*Wharton	C	1
*Wheeler	B	1
*Wichita	B	2
Wilbarger	C	1
Willacy	D	1
*Williamson	D	2
Wilson	C	1
*Winkler	A	1
*Wise	B	1
*Wood	C	1
*Yoakum	A	1
*Young	B	1
Zapata	D	1
Zavala	D	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Virginia

*Accomac	D	1
*Albemarle	C	1
*Alleghany	B	1
*Amelia	D	1
*Amherst	B	1
*Appomattox	C	1
*Arlington	A	2
*Augusta	B	1
*Bath	C	1
*Bedford	B	1
*Bland	D	1
*Botetourt	B	1
*Brunswick	D	1
Buchanan	C	1
*Buckingham	D	1
*Campbell	B	1
*Caroline	C	1
*Carroll	C	1
*Charles City	C	1
*Charlotte	D	1
*Chesterfield	A	2
*Clarke	C	1
*Craig	C	1
*Culpeper	C	1
*Cumberland	D	1
Dickenson	C	1
*Dinwiddie	C	1
*Essex	C	1
Fairfax	B	3
*Fauquier	C	1
*Floyd	C	1
*Fluvanna	C	1
*Franklin	C	1
*Frederick	B	1
Giles	B	1
*Gloucester	C	1
*Goochland	C	1
*Grayson	C	1
*Greene	C	1
*Greensville	D	1
*Halifax	D	1
*Hanover	B	1
*Henrico	A	2
*Henry	B	1
*Highland	D	1
*Isle of Wight	C	1
*James City	B	1
*King and Queen	C	1

Virginia-continued

*King George	B	1
*King William	B	1
*Lancaster	C	1
Lee	D	1
*Loudoun	B	1
*Louisa	C	1
*Lunenburg	D	1
*Madison	D	1
*Mathews	C	1
*Mecklenburg	D	1
*Middlesex	D	1
*Montgomery	D	1
*Nansemond	C	1
*Nelson	C	1
*New Kent	B	1
*Northampton	D	1
*Northumberland	C	1
*Nottoway	C	1
*Orange	C	1
*Page	C	1
*Patrick	C	1
*Pittsylvania	C	2
*Powhatan	C	1
*Prince Edward	D	1
*Prince George	C	1
*Prince William	B	1
*Pulaski	B	1
*Rappahannock	C	1
*Richmond	C	1
*Roanoke	B	2
*Rockbridge	D	1
*Rockingham	C	1
Russell	C	1
Scott	D	1
*Shenandoah	B	1
*Smyth	B	1
*Southampton	D	1
*Spotsylvania	B	1
*Stafford	B	1
*Surry	D	1
*Sussex	D	1
*Tazewell	C	2
*Warren	B	1
*Washington	C	1
*Westmoreland	C	1
Wise	C	1
*Wythe	C	1
*York	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

SOUTH-continued

Virginia-continued

Independent Cities

Alexandria	A	2
Bristol	C	1
Buena Vista	B	1
Charlottesville	B	1
*Chesapeake	A	2
Clifton Forge	B	1
Colonial Heights	A	1
Covington	A	1
Danville	B	2
Fairfax	A	1
Falls Church	A	1
Franklin	B	1
Fredericksburg	D	1
Galax	C	1
Hampton	B	2
Harrisonburg	D	1
Hopewell	A	1
Lynchburg	B	2
Martinsville	B	1
Newport News	B	2
Norfolk	C	3
Norton	C	1
Petersburg	C	2
Portsmouth	C	2
Radford	C	1
Richmond	B	3
Roanoke	B	2
South Boston	C	1
Staunton	B	1
Suffolk	B	1
*Virginia Beach	B	2
Waynesboro	A	1
Williamsburg	D	1
Winchester	B	1

West Virginia

Barbour	D	1
Berkeley	B	1
Boone	B	1
Braxton	D	1
Brooke	A	1
Cabell	B	2
Calhoun	D	1

West Virginia-continued

Clay	D	1
Doddridge	C	1
Fayette	C	2
Gilmer	D	1
Grant	D	1
Greenbrier	C	1
Hampshire	D	1
Hancock	A	1
Hardy	D	1
Harrison	B	2
Jackson	B	1
Jefferson	C	1
Kanawha	A	3
Lewis	C	1
Lincoln	D	1
Logan	B	2
McDowell	C	2
Marion	B	2
Marshall	B	1
Mason	B	1
Mercer	C	2
Mineral	B	1
Mingo	C	1
Monongalia	C	2
Monroe	D	1
Morgan	C	1
Nicholas	C	1
Ohio	B	2
Pendleton	D	1
Pleasants	B	1
Pocahontas	C	1
Preston	C	1
Putnam	B	1
Raleigh	C	2
Randolph	C	1
Ritchie	C	1
Roane	C	1
Summers	D	1
Taylor	C	1
Tucker	D	1
Tyler	C	1
Upshur	D	1
Wayne	B	1
Webster	D	1
Wetzel	B	1
Wirt	C	1
Wood	B	2
Wyoming	B	1

POOR DIETS IN COUNTIES, Spring 1965-continued

WEST

Arizona

Apache	B	1
Cochise	A	2
Coconino	A	1
Gila	A	1
Graham	A	1
Greenlee	A	1
Maricopa	A	3
Mohave	A	1
Navajo	A	1
Pima	A	3
Pinal	A	2
Santa Cruz	A	1
Yavapai	A	1
Yuma	A	1

# California

Alameda	A	4
Amador	A	1
*Butte	A	2
*Calaveras	A	1
Colusa	A	1
Contra Costa	A	3
*Del Norte	A	1
El Dorado	A	1
Fresno	A	3
*Glenn	A	1
Humboldt	A	2
*Imperial	A	2
Inyo	A	1
Kern	A	3
Kings	A	1
*Lake	A	1
Lassen	A	1
Los Angeles	A	4
Madera	A	1

California-continued

*Marin	A	2
*Mariposa	A	1
Mendocino	A	1
Merced	A	2
Modoc	A	1
*Mono	A	1
*Monterey	A	2
*Napa	A	2
*Nevada	A	1
*Orange	A	3
*Placer	A	1
Plumas	A	1
*Riverside	A	3
Sacramento	A	3
*San Benito	A	1
*San Bernardino	A	3
*San Diego	A	4
San Francisco	A	4
San Joaquin	A	3
San Luis Obispo	A	2
San Mateo	A	3
Santa Barbara	A	2
Santa Clara	A	3
Santa Cruz	A	2
Shasta	A	2
*Sierra	A	1
Siskiyou	A	1
*Solano	A	2
Sonoma	A	2
Stanislaus	A	2
Sutter	A	1
Tehama	A	1
*Trinity	A	1
Tulare	A	2
Tuolumne	A	1
Ventura	A	2
Yola	A	2
Yuba	A	1

# California - Data not available for classifying\*Alpine County.

POOR DIETS IN COUNTIES, Spring 1965-continued

WEST-continued

# Colorado

Adams	A	2
Alamosa	A	1
Arapahoe	A	2
Archuleta	A	1
*Baca	A	1
Bent	A	1
Boulder	A	2
Chaffee	A	1
Cheyenne	A	1
Clear Creek	A	1
Conejos	A	1
Costilla	B	1
Crowley	A	1
Custer	B	1
Delta	A	1
Denver	A	3
Dolores	A	1
*Douglas	A	1
*Eagle	A	1
Elbert	A	1
El Paso	A	2
Fremont	A	1
Garfield	A	1
Gilpin	A	1
Grand	A	1
Gunnison	B	1
Huerfano	B	1
*Jackson	A	1
Jefferson	A	2
Kiowa	A	1
Kit Carson	A	1
Lake	A	1
La Plata	A	1
Larimer	A	2
Las Animas	A	1
Lincoln	A	1
Logan	A	1
Mesa	A	1
*Moffat	A	1
Montezuma	A	1
Montrose	A	1
Morgan	A	1
Otero	A	1
*Ouray	A	1
*Park	A	1

Colorado-continued

Phillips	A	1
*Pitkin	A	1
Prowers	A	1
Pueblo	A	2
*Rio Blanco	A	1
Rio Grande	A	1
Routt	A	1
Saguache	A	1
*San Juan	A	1
San Miguel	A	1
Sedgwick	A	1
*Summit	A	1
Teller	A	1
Washington	A	1
Weld	A	2
Yuma	A	1

Idaho

*Ada	A	2
*Adams	A	1
*Bannock	A	1
*Bear Lake	A	1
Benewah	A	1
*Bingham	A	1
*Blaine	A	1
*Boise	A	1
Bonner	A	1
*Bonneville	A	1
Boundary	A	1
*Butte	A	1
*Camas	A	1
*Canyon	A	2
*Caribou	A	1
*Cassia	A	1
*Clark	A	1
Clearwater	A	1
*Custer	A	1
*Elmore	A	1
*Franklin	A	1
*Fremont	A	1
*Gem	A	1
*Gooding	A	1
Idaho	A	1
*Jefferson	A	1

# Colorado - Data not available for classifying  
Hinsdale and Mineral Counties.

POOR DIETS IN COUNTIES, Spring 1965-continued

WEST-continued

Idaho-continued

*Jerome	A	1
Kootenai	A	1
Latah	A	1
Lemhi	A	1
Lewis	A	1
*Lincoln	A	1
*Madison	A	1
*Minidoka	A	1
Nez Perce	A	1
*Oneida	A	1
*Owyhee	A	1
*Payette	A	1
*Power	A	1
Shoshone	A	1
*Teton	A	1
*Twin Falls	A	1
*Valley	A	1
*Washington	A	1

Montana

*Beaverhead	B	1
*Big Horn	A	1
*Blaine	A	1
*Broadwater	A	1
*Carbon	A	1
*Carter	A	1
Cascade	A	2
*Chouteau	A	1
*Custer	A	1
*Daniels	A	1
*Dawson	A	1
Deer Lodge	A	1
*Fallon	A	1
*Fergus	A	1
Flathead	A	1
*Gallatin	A	1
*Garfield	A	1
Glacier	A	1
*Golden Valley	A	1
*Granite	A	1
*Hill	A	1
*Jefferson	A	1
*Judith Basin	A	1
*Lake	A	1
Lewis and Clark	A	1
*Liberty	A	1
Lincoln	A	1
*McCone	A	1

Montana-continued

*Madison	A	1
*Meagher	A	1
*Mineral	A	1
*Missoula	A	1
*Musselshell	A	1
*Park	A	1
*Petroleum	A	1
*Phillips	A	1
*Pondera	A	1
*Powder River	A	1
*Powell	A	1
*Prairie	A	1
*Ravalli	A	1
*Richland	A	1
Roosevelt	A	1
*Rosebud	A	1
*Sanders	A	1
*Sheridan	A	1
Silver Bow	A	1
*Stillwater	A	1
*Sweet Grass	A	1
*Teton	A	1
*Toole	A	1
*Treasure	A	1
Valley	A	1
*Wheatland	A	1
*Wibaux	A	1
*Yellowstone	A	2

Nevada

Churchill	A	1
Clark	A	2
*Douglas	A	1
Elko	A	1
*Esmeralda	A	1
Eureka	A	1
Humboldt	A	1
*Lander	A	1
Lincoln	A	1
*Lyon	A	1
Mineral	A	1
*Nye	A	1
Ormsby	A	1
Pershing	A	1
*Storey	A	1
*Washoe	A	2
White Pine	A	1

POOR DIETS IN COUNTIES, Spring 1965-continued

WEST-continued

New Mexico

Bernalillo	A	2
Catron	A	1
Chaves	A	1
Colfax	A	1
Curry	A	1
De Baca	A	1
Dona Ana	A	1
Eddy	A	1
Grant	A	1
Guadalupe	A	1
Harding	A	1
Hidalgo	A	1
Lea	A	1
Lincoln	A	1
Los Alamos	A	1
Luna	A	1
McKinley	A	1
Mora	B	1
Otero	A	1
Quay	A	1
Rio Arriba	B	1
Roosevelt	A	1
Sandoval	B	1
San Juan	A	1
San Miguel	B	1
Santa Fe	A	1
Sierra	B	1
Socorro	B	1
Taos	B	1
Torrance	A	1
Union	A	1
Valencia	A	1

Oregon

Baker	A	1
Benton	A	1
Clackamas	A	2
Clatsop	A	1
Columbia	A	1
Coos	A	1
Crook	A	1
Curry	A	1
Deschutes	A	1
Douglas	A	2
Gilliam	A	1
Grant	A	1
Harney	A	1
Hood River	A	1
Jackson	A	2
Jefferson	A	1
Josephine	A	1
Klamath	A	1
Lake	A	1
Lane	A	2
Lincoln	A	1
Linn	A	2
Malheur	A	1
Marion	A	2
Morrow	A	1
Multnomah	A	3
Polk	A	1
Sherman	A	1
*Tillamook	A	1
Umatilla	A	1
Union	A	1
Wallowa	A	1
Wasco	A	1
Washington	A	2
Wheeler	A	1
Yamhill	A	1

POOR DIETS IN COUNTIES, Spring 1965-continued

WEST-continued

Utah

Beaver	A	1
Box Elder	A	1
Cache	A	1
Carbon	A	1
Daggett	A	1
Davis	A	1
Duchesne	A	1
Emery	A	1
Garfield	A	1
Grand	A	1
Iron	A	1
Juab	A	1
Kane	A	1
Millard	A	1
Morgan	A	1
Piute	A	1
Rich	A	1
Salt Lake	A	3
San Juan	A	1
Sanpete	A	1
Sevier	A	1
Summit	A	1
Tooele	A	1
Uintah	A	1
Utah	A	2
Wasatch	A	1
Washington	A	1
Wayne	A	1
Weber	A	2

Washington

Adams	A	1
Asotin	A	1
Benton	A	1
Chelan	A	1
Clallam	A	1
Clark	A	2
Columbia	A	1
Cowlitz	A	1
Douglas	A	1
Ferry	A	1
Franklin	A	1
Garfield	A	1
Grant	A	1
Grays Harbor	A	1
Island	A	1
Jefferson	A	1
King	A	3

Washington-continued

Kitsap	A	2
Kittitas	A	1
Klickitat	A	1
Lewis	A	1
Lincoln	A	1
Mason	A	1
Okanogan	A	1
Pacific	A	1
Pend Oreille	A	1
Pierce	A	3
San Juan	A	1
Skagit	A	1
Skamania	A	1
Snohomish	A	2
Spokane	A	3
Stevens	A	1
Thurston	A	1
Wahkiakum	A	1
Walla Walla	A	1
Whatcom	A	2
Whitman	A	1
Yakima	A	2

Wyoming

Albany	A	1
Big Horn	A	1
Campbell	A	1
Carbon	A	1
Converse	A	1
Crook	A	1
Fremont	A	1
Goshen	A	1
Hot Springs	A	1
Johnson	A	1
Laramie	A	1
Lincoln	A	1
Natrona	A	1
Niobrara	A	1
Park	A	1
Platte	A	1
Sheridan	A	1
Sublette	A	1
Sweetwater	A	1
Teton	A	1
Uinta	A	1
Washakie	A	1
Weston	A	1

## DESCRIPTION OF TABLES

As of Spring, 1965

Table 1. Households with Poor Diets, by region, by urbanization.

The top section shows percent of households with poor diets in each region-urbanization category, and the lower section shows, in corresponding cells, the number of households with poor diets.

Table 2. Households with Poor Diets, by State.

States are listed in alphabetical order within region and show the percent and number with poor diets.

Table 3. Counties classified by Percent of Households with Poor Diets, by region.  
and

Table 4. Households with Poor Diets classified by Percent of Households with Poor Diets in County, by region.

The top section of tables 3 and 4 show, by region and by the categories of percents used in the "list of counties," the number of counties (table 3) and number of households (table 4). The second and third sections show, respectively, percentage distributions by category within region and by region within category.

Table 5. Counties classified by Number of Households with Poor Diets in County, by region.  
and

Table 6. Households with Poor Diets classified by Number with Poor Diets in County, by region.

The top sections of tables 5 and 6 show, by region and by the categories of number of households with poor diets used in the "list of counties," the number of counties (table 5) and number of households (table 6). The second and third sections show, respectively, percentage distributions by category within region and by region within category.

Table 1.--HOUSEHOLDS with POOR DIETS, by region, by urbanization: Spring 1965

Urbanization	Percent of households in each region-urbanization category				
	United States	North-east	North Central	South	West
All	21	17	22	24	17
Urban	20	17	21	23	23
Rural nonfarm	22	17	23	25	19
Rural farm	22	17	23	25	15

	Number of households				
	United States	North-east	North Central	South	West
	millions	millions	millions	millions	millions
All	11.0	2.3	3.3	3.9	1.5
Urban	8.0	1.9	2.3	2.5	1.2
Rural nonfarm	2.3	.4	.7	1.1	.2
Rural farm	.7	*	.3	.4	*

\* Less than 50,000 households.

- NOTES: 1. Data will not necessarily add to totals because of rounding.  
 2. Alaska and Hawaii have been omitted.  
 3. Households: Those with at least one person having 10 or more meals from the household food supply during a seven day period.  
 4. Poor diets: Those providing less than two-thirds of NRC allowances in one or more of seven nutrients - protein, calcium, iron, vitamin A value, thiamine, riboflavin, and ascorbic acid.

Source: 1. Percent - Dietary Levels of Households in the United States, Spring 1965; ARS 62-17.  
 2. Number of households - Estimated from patterns of dietary adequacy determined from ARS 62-17 in conjunction with counts of households from Census reports, 1960 and 1965.

Table 2.--HOUSEHOLDS with POOR DIETS, by State: Spring 1965

State	Percent	Number
	(households in State = 100)	thousands

## Northeast

Connecticut	16	123
Maine	20	53
Massachusetts	17	258
New Hampshire	18	34
New Jersey	16	298
New York	17	906
Pennsylvania	18	576
Rhode Island	19	47
Vermont	20	21

## North Central

Illinois	21	629
Indiana	22	297
Iowa	24	187
Kansas	23	152
Michigan	21	466
Minnesota	23	219
Missouri	24	314
Nebraska	24	99
North Dakota	24	41
Ohio	21	592
South Dakota	25	46
Wisconsin	22	241

Table 2.--HOUSEHOLDS with POOR DIETS, by State: Spring 1965-Continued

State	Percent	Number
	(households in State = 100)	thousands
South		
Alabama	25	227
Arkansas	27	143
Delaware	21	27
District of Columbia	23	55
Florida	24	416
Georgia	25	279
Kentucky	25	211
Louisiana	25	227
Maryland	20	186
Mississippi	27	155
North Carolina	25	314
Oklahoma	24	179
South Carolina	26	159
Tennessee	25	259
Texas	24	684
Virginia	24	265
West Virginia	24	116
West		
Arizona	18	73
California	16	860
Colorado	18	95
Idaho	18	34
Montana	18	35
Nevada	16	20
New Mexico	18	44
Oregon	17	96
Utah	17	42
Washington	17	143
Wyoming	17	15

NOTES: See table 1, notes 2-4.

Source: Estimated from patterns of dietary adequacy determined from ARS 62-17 in conjunction with counts of households from Census reports, 1960 and 1965.

Table 3.--COUNTIES classified by Percent of Households with Poor Diets  
in County, by region: Spring 1965

Percent of households with poor diets in county	Number of counties				
	United States	North- east	North Central	South	West
All	3,098	217	1,055	1,418	408
Less than 22 percent	792	215	114	68	395
22-24	701	2	417	269	13
25-26	822	0	388	434	0
27-30	783	0	136	647	0

	Counties distributed by "percent of households" category within region				
	United States	North- east	North Central	South	West
	percent	percent	percent	percent	percent
All	100	100	100	100	100
Less than 22 percent	26	99	11	5	97
22-24	23	1	40	19	3
25-26	27	0	37	31	0
27-30	25	0	13	46	0

	Counties distributed by region within "percent of households" category				
	United States	North- east	North Central	South	West
	percent	percent	percent	percent	percent
All	100	7	34	46	13
Less than 22 percent	100	27	14	9	50
22-24	100	*	59	38	2
25-26	100	0	47	53	0
27-30	100	0	17	83	0

\* Less than 0.5.

NOTES: 1. See table 1, notes 1-4.

2. Five counties omitted because classifying data not available:  
Alpine, California; Hinsdale and Mineral, Colorado; Loving, Texas;  
and Menominee, Wisconsin.

Source: See table 2.

Table 4.--HOUSEHOLDS with Poor Diets classified by Percent of Households with Poor Diets in County, by region: Spring 1965

Percent of households with poor diets in county	Number of households				
	United States	North- east	North Central	South	West
	millions	millions	millions	millions	millions
All	11.0	2.3	3.3	3.9	1.5
Less than 22 percent	5.9	2.3	1.6	.5	1.5
22-24	2.5	*	1.0	1.4	*
25-26	1.5	0	.5	1.0	0
27-30	1.1	0	.2	1.0	0

	Households distributed by "percent of households" category within region				
	United States	North- east	North Central	South	West
	percent	percent	percent	percent	percent
All	100	100	100	100	100
Less than 22 percent	53	100	49	12	100
22-24	23	*	32	37	*
25-26	14	0	14	26	0
27-30	10	0	5	25	0

	Households distributed by region within "percent of households" category				
	United States	North- east	North Central	South	West
	percent	percent	percent	percent	percent
All	100	21	30	35	14
Less than 22 percent	100	39	28	8	26
22-24	100	*	42	58	*
25-26	100	0	32	68	0
27-30	100	0	14	86	0

\* Less than 0.5.

NOTES: 1. See table 1, notes 1-4.

2. Households from five counties omitted because classifying data not available. See table 3, note 2.

Source: See table 2.

Table 5.--COUNTIES classified by Number of Households with Poor Diets  
in County, by region: Spring 1965

Number of households with poor diets in county	Number of counties				
	United States	North- east	North Central	South	West
All	3,098	217	1,055	1,418	408
Less than 3,000	2,432	86	868	1,140	338
3,000-11,999	513	88	151	226	48
12,000-49,999	128	35	29	46	18
50,000 or more	25	8	7	6	4

	Counties distributed by "number of households" category within region				
	United States	North- east	North Central	South	West
	percent	percent	percent	percent	percent
All	100	100	100	100	100
Less than 3,000	79	40	82	80	83
3,000-11,999	17	41	14	16	12
12,000-49,999	4	16	3	3	4
50,000 or more	1	4	1	*	1

	Counties distributed by region within "number of households" category				
	United States	North- east	North Central	South	West
	percent	percent	percent	percent	percent
All	100	7	34	46	13
Less than 3,000	100	4	36	47	14
3,000-11,999	100	17	29	44	9
12,000-49,999	100	27	23	36	14
50,000 or more	100	32	28	24	16

\* Less than 0.5.

NOTES: 1. See table 1, notes 1-4.

2. See table 3, note 2.

Source: See table 2.

Table 6.--HOUSEHOLDS with Poor Diets classified by Number with Poor Diets  
in County, by region: Spring 1965

Number of households with poor diets in county	Number of households				
	United States	North- east	North Central	South	West
	millions	millions	millions	millions	millions
All	11.0	2.3	3.3	3.9	1.5
Less than 3,000	2.8	.2	1.0	1.4	.3
3,000-11,999	2.7	.5	.8	1.1	.3
12,000-49,999	2.9	.8	.6	1.0	.4
50,000 or more	2.5	.8	.8	.4	.5

	Households distributed by "number of households" category within region				
	United States	North- east	North Central	South	West
	percent	percent	percent	percent	percent
All	100	100	100	100	100
Less than 3,000	26	7	31	36	18
3,000-11,999	25	23	25	29	19
12,000-49,999	27	37	20	26	29
50,000 or more	22	33	24	10	34

	Households distributed by region within "number of households" category				
	United States	North- east	North Central	South	West
	percent	percent	percent	percent	percent
All	100	21	30	35	13
Less than 3,000	100	6	36	49	9
3,000-11,999	100	19	30	41	10
12,000-49,999	100	29	22	34	14
50,000 or more	100	32	32	16	20

NOTES: 1. See table 1, notes 1-4.

2. Households from five counties omitted because classifying data not available. See table 3, note 2.

Source: See table 2.

## NUTRITIONAL STATUS AND DIETARY STUDIES 1957-1967

On the following pages, studies of nutritional status and dietary intakes in the period 1957 to 1967 have been abstracted from reports published in scientific journals and a few unpublished reports. The abstracts are arranged by geographic regions and states within the regions.

Fifty-one studies have included some physical or biochemical measures for assessment of nutritional status of 28,429 people in the United States, Puerto Rico, and the Virgin Islands. The number studied in the different age groups are:

833	Infants
1,402	Preschool children
628	Infants and preschool children
2,757	Infants and children
134	Grade school children
7,595	Teenagers
5,898	Pregnant women
3,203	Adults
1,339	Older people
4,640	Individuals (ages not specified)

Distribution of these studies by regions is shown in Table A.

Sixty-three dietary studies have involved a total of 45,393 people.

4,350	Infants
196	Preschool children
128	Children
743	Grade school children
10,000	School children
8,725	Teenagers
5,834	Adults
1,054	Pregnant women
1,420	Older people
12,943	Persons in households and families

Distribution of these studies by regions is shown in Table B.

Most of the studies have been focused on low-income groups, including Caucasians, Indians, Negroes, Orientals, and Puerto Ricans. Infants and preschool children, teenagers, pregnant women, and people over 50 years of age have received particular attention

The nutritional status and dietary studies done in the past ten years suggest that nutritional health as a whole is satisfactory, but segments of the population still have problems associated with obtaining an adequate diet. Continual reevaluation of the nutritional status of the population and improvement of methods are needed if we are to remain informed as to the real problems of our people.

In the studies reported, the quality of nutrition was generally related to economic status and level of education. The poorest diets were those of people in rural communities in Puerto Rico, Indians on reservations in the West, Eskimos, Aleuts and Indians in Alaska, Negro migrant agricultural workers, and teenagers from low-income families in urban areas in the Northeast. The foods most needed to improve diets were milk, citrus fruits, and green and yellow vegetables.

Infants and children from families of the lower economic level, such as Negro migrant families in the South and inhabitants of rural areas of Puerto Rico, tended to be below average in height and weight, suggestive of undernutrition. Obesity was observed in 15-20% of approximately 3,000 adolescents studied. Among the segments of the older population studied, overweight was prevalent.

In the few studies which involve any biochemical analysis of protein nutrition status, there was an indication that protein malnutrition is not extensive but does exist in some of the population with lower income levels. Five cases of kwashiorkor were reported in the South and some evidence of marasmus was noted in children of Negro migrant families. Of 642 New York City school children, only 7% had amino acid ratios indicative of poor protein nutrition. Serum protein levels were low in one of three communities studied in Puerto Rico and tended to be high for Alaskans.

Iron-deficiency anemia was common in pregnant women and infants and was often accompanied by low folic acid serum levels during pregnancy. Anemia was not often noted in 3,000 adolescents studied.

Biochemical and clinical evidences of vitamin deficiencies in this country are relatively rare. In a study of 642 New York City school children, approximately 5% showed clinical signs which may have been caused by vitamin deficiencies. However, the serum vitamin levels of these children did not differ from those of children without symptoms of deficiency. The incidence of scurvy and of rickets in the United States in the period 1956-60 was reported to be 1 in 3,300 and 1 in 2,791, respectively, in infants and children admitted to pediatrics hospitals. When vitamin analyses have been made on subjects on studies conducted in the United States, it has usually been found that serum vitamin A is acceptable or high. There is some occurrence of low blood ascorbic acid and of low blood and urine thiamine. Riboflavin and N-methylnicotinamide in the urine are usually in the normal range.

Dietary evaluation data do not always correlate well with biochemical data from the same subjects. A dietary survey may reflect intake of a nutrient for only one day of the year, while the biochemical examination gives information as to the status of nutrition over a period of time.

Among the many studies made during the past decade which involved dietary surveys, ascorbic acid, vitamin A, calcium, and iron were the nutrients most commonly found in the diets in amounts below the Recommended Dietary Allowances of the Food and Nutrition Board, National Research Council. In many studies, there was a tendency toward high rather than low nutrient intakes, although vitamin A and ascorbic acid intakes fluctuated with the season. There is some indication that there is a low intake of some of the B vitamins.

In the few studies carried out, Government food donations and food stamps appeared to improve the diets of participants. Participation in school lunch programs was an important factor for the improvement of diets of school children.

Table A

## NUTRITIONAL STATUS STUDIES

Numbers of Subjects by Regions and Age Groups

Region	Infants	Preschool	Grade School	Teenagers	Adults:	Pregnant:	Older people:	Age not	TOTAL
	0 - 1	2 - 5	6 - 10	11 - 19	20-49	women	50 and over	identified:	
N. East	-----628-----		134	3,148	231	1,076	458		6,317
			---642---						
N. Central:	797			2,984		4,744	200		8,725
South	36	1,402			1,281	78	681	120	3,598
West	-----1,201 children-----			1,232	1,691			700	4,824
Puerto Rico									
Virgin Islands				231				3,178	3,178
U.S.	Infants and children in 226 hospitals								
	713 cases of scurvy								
	843 cases of nutritional rickets								
									231
									1,556
									<u>28,429</u>

## DIETARY STUDIES

[illegible]

\*Number of persons estimated from number of households or families surveyed and average number of persons per household.

## NUTRITIONAL STATUS AND DIETARY STUDIES IN PROGRESS

Reports of work in progress in many areas of the United States show that efforts to evaluate the nutritional status and dietary intakes of selected segments of the population are continuing. The diets and nutriture of preschool children in families with low and moderate incomes are being studied in Hawaii under a Cooperative Agreement between the University of Hawaii and the Agricultural Research Service. The nutritional status of people in two rural isolated communities of Puerto Rico is being re-evaluated by investigators in the School of Medicine of the University of Puerto Rico. The research is being supported in part by the U. S. Public Health Service.

Scientists in Agricultural Experiment Stations in Iowa, Illinois, Kansas, Nebraska and Ohio are cooperating in a North Central Regional Research Project to determine the food buying practices of families with preschool children. Factors which influence the practices of buying and using food and the outcome in relation to dietary adequacy and the use of time, energy and money are being studied.

In four Agricultural Experiment Stations studies of food consumption and nutritional status are in progress. In Arizona the food consumption patterns of one and two person households where one member is 65 years or older are being investigated. In Colorado a current study is directed to the effect of diet and environmental conditions on the nutritional status of adolescents and older people in selected areas of the State. In Vermont evaluations of the biochemical status with respect to specific nutrients are being extended to additional groups of the population. In South Carolina nutritional evaluations of industrial lunches and diets of industrial workers are continuing.

Under a grant from the Children's Bureau, investigators from the Children's Hospital, Ohio State University College of Medicine, are doing pilot studies before undertaking a nationwide study of the nutritional status of preschool children in the United States. They have recently completed the initial stage of a pilot study in 17 randomly selected counties in Mississippi in cooperation with the Mississippi State Board of Health and the University of Mississippi Medical Center. Dietary data, physical examinations and biochemical measures of nutritional status are being analyzed.

The Children's Bureau reports that during the months of March and April, 1968, data relevant to nutritional status are being collected in 39 of the Children and Youth Comprehensive Health Care Projects throughout the nation. Height, weight, birth weight, hemoglobin concentration, hematocrit values and diagnostic conditions with an indication of their relationship to nutritional status will be reported.

Medical scientists in the School of Medicine, Tulane University, are receiving support from the U. S. Public Health Service for clinical and biochemical examinations to evaluate the nutritional status of school children throughout the State of Louisiana. The sample of several thousand children was deliberately biased toward the low income, non urban, and non-white population. Institutionalized school age children and pregnant teen-age girls are sub-groups receiving special attention in the City of New Orleans. Preliminary results on 12 to 16 year old children throughout the State indicate that the dietary intakes of calcium, iron, vitamin A by white children, but not by Negroes, and ascorbic acid are more frequently below levels considered adequate. An appreciable incidence of obesity was the only significant clinical finding.

The National Institute of Child Health and Human Development and the Baltimore City Hospitals are obtaining 7-day diet records from people of different ages in order to characterize and identify age-related differences in type and quantity of specific nutrients in the diet. The diet records of 252 people thus far analyzed indicate that, with the exception of calcium, the Recommended Dietary Allowances were exceeded by most subjects.

## NUTRITIONAL STATUS STUDIES

### UNITED STATES

#### General

Reference: American Academy of Pediatrics, Committee on Nutrition. Infantile Scurvy and Nutritional Rickets in the United States. Pediatrics 29: 646, 1962.

Subjects: Infants and children in U. S. hospitals, 1956-1960. 226 hospitals with approved residency programs in pediatrics.

Methods: Questionnaire to hospitals.

#### Nutritional

Status: During the five-year period from 1956-1960, 713 cases of scurvy and 843 cases of nutritional rickets were observed. Of the children admitted to these hospitals, approximately one in 3300 had scurvy and one in 2791 had rickets. Incidence of scurvy was one in 1317 in Florida and one in 9590 in California. Nearly 1/2 the cases of rickets came from 21 hospitals; there was no particular geographical distribution.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST

Massachusetts  
Boston

Reference: Dwyer, J. T., Feldman, J. J., and Mayer, J.  
Adolescent Dieters: Who Are They? Physical Characteristics,  
Attitudes and Dieting Practices of Adolescent Firls.  
Am. J. Clin. Nutr. 20(10): 1045, 1967.

Subjects: 446 female graduating senior high school students.  
Predominantly middle and upper-middle class suburban  
community.

Methods: Triceps skinfold measurements.

Nutritional  
Status: Fifteen percent of the subjects were obese.

Boston

Reference: Wenzel, B. J., Stults, H. B., and Mayer, J.  
Hypoferraemia in Obese Adolescents. Lancet 2, 7251:  
327, 1962.

Subjects: 163 males, 192 females, 11-19 yrs.

Methods: Height, weight, hemoglobin, serum iron.

Nutritional  
Status: Obesity was noted in 25 boys and 36 girls. The obese  
had low serum iron and normal hemoglobin as compared  
to that of normal weight subjects.

## NUTRITIONAL STATUS STUDIES--continued

### NORTHEAST--continued

#### New Jersey Jersey City

Reference: Leevy, C. M., Cardi, L., Frank, O., Gellene, R., and Baker, H.  
Incidence and Significance of Hypovitaminemia in a Randomly Selected Municipal Hospital Population. Am. J. Clin. Nutr. 17(4): 259, 1965.

Subjects: 120 adult patients, 50 men and 61 women, over 25 yrs.  
77, white; 40, Negro; 3, Puerto Rican; all were poor.

Methods: Medical examination; biochemical studies; vitamins A and E, ascorbic acid, and 8 B vitamins were estimated in the blood. Food consumption for week preceding admission to hospital reported by each patient.

#### Nutritional

Status: In 105 patients, values for at least 1 vitamin were low and in 71, values for at least 2. Folic acid deficiency was most common in 45% of the 105. Over 25% had a deficiency of thiamine, niacin, and vitamin B<sub>6</sub>. Of the 105, 90% had indications of poor protein nutrition. There was a history of deficient dietary intake in 39% of the patients with hypovitaminemia. A history of dietary deficiency was best correlated with the presence of low circulating levels of vitamin A, ascorbic acid, and vitamin B<sub>6</sub>. Clinical signs of vitamin deficiency were present in 46 of the 120 patients, not all of whom had low values in blood.

## NUTRITIONAL STATUS STUDIES--continued

### NORTHEAST--continued

#### New York King Ferry

Reference: Thiele, V. F., Brin, M., and Dibble, M. V.

Nutritional Status Evaluation of Negro Migrant Workers in King Ferry, New York. Federation Proceedings 27(2): 679, 1968. Abstract Number 2601.

Subjects: 111 Negro migrant farm workers.

Methods: Observations of food consumption. Blood samples analyzed for hematocrit, plasma ascorbic acid, carotene, vitamin A, and erythrocyte hemolysate transketolase activity. Urine samples analyzed for creatinine, thiamine, and riboflavin.

#### Nutritional Status:

Due to the lack of cooking facilities in the housing units all food preparation was done by the wives of the crew bosses or helpers. Generally, one meal was consumed per day. This consisted of beans and rice, (or rice and gravy), luncheon meat sandwich, potato chips and wine or coffee. The food consumed in the greatest quantity was rice. More money was spent on alcoholic beverages than on any other item.

Of the total population, the following percentages were below adequate levels for biochemical measures of nutritional status (deficient plus low on basis of ICNND criteria): Ascorbic acid 14.0, carotene 4.7, vitamin A 2.4, thiamine 36.5, and riboflavin 33.3.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

New York

New York City

Reference: Baker, H., Frank, O., Feingold, S., Christakis, G., and Ziffer, H.

Vitamins, Total Cholesterol, and Triglycerides in 642 New York City School Children. Am. J. Clin. Nutr. 20(8): 850, 1967.

Subjects: 642 Puerto Rican, Chinese, Negro, and Caucasian children, 10-13 yrs. Parents predominantly factory, service, or trade workers. 19% welfare assistance.

Methods: Blood thiamine, biotin, riboflavin, pantothenic acid, niacin, vitamin B<sub>6</sub>, vitamin B<sub>12</sub>, folic acid, vitamin A, ascorbic acid, total cholesterol, triglycerides. Calculation of grams of high quality protein consumed.

Nutritional  
Status:

Thiamine, biotin, and ascorbic acid were all markedly below the mean values for the total population when protein intake was inadequate. Protein intake was below adequate for 12% of the subjects.

Puerto Ricans. This group had lower levels of thiamine, niacin, vitamin B<sub>12</sub>, and folate, and higher levels of biotin, pantothenate, and vitamin E than the total population. Approximately 60% of the group had lowered folate and niacin levels.

Chinese. Of the Chinese subjects, 94% had above the thiamine mean; 81% above the ascorbic acid mean; 71% above the folate mean. The B<sub>6</sub>, niacin, and B<sub>12</sub> levels were also much higher. This group had lower vitamin A, pantothenate, riboflavin, and vitamin E levels.

Negro. Vitamin B<sub>12</sub> levels were above the mean of the total population for 82%; their folate, vitamin A, and vitamin E levels were also higher than the mean.

Approximately 68% of this group fell below the total population mean in thiamine, biotin, and pantothenate.

Caucasian. Between 61-66% had higher levels of pantothenate, vitamin A, and vitamin E than the total population; riboflavin was somewhat lower.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

New York

New York City

- Reference: Christakis, G., Miridjanian, A., Nath, I., Khurana, H. S., Cowell, C., Archer, M., Frank, O., Ziffer, H., Baker, H., and James, G.  
A Nutritional Epidemiologic Investigation of 642 New York City Children. Am. J. of Clin. Nutr. 21(1): 107, 1968.
- Subjects: 642 children from 6 primary schools of lower East Side of Manhattan. Children 10-13 yrs. 56% girls. 64%, Puerto Rican; 13.7%, Chinese; 10%, Negro; 8%, Caucasian. 19% received welfare assistance (as indicated by children). Parents predominantly factory, service, or trade workers.
- Methods: 24-hr. recall diet histories obtained from the children by a public health nutritionist. 6 food groups were defined. An average value for each of 9 micronutrients was determined by summing the values for the given micronutrient of the individual foods within the 6 major groups and dividing by the number of representative foods. Physical examination, RBC counts, hemoglobin, hematocrit, plasma amino acid ratios.
- Nutritional Status: Of the children's diets, 73.2% were judged to be poor, 20.2% were considered adequate, and 6.6% were deemed excellent. The Chinese had significantly better diets than the other groups, the Puerto Rican subjects the poorest. Children whose families were not on welfare had twice the frequency of excellent diet histories. A relatively greater proportion of children with poor diet histories had low hemoglobins and high amino acid ratios. 3% of the total study group exhibited hemoglobin levels of less than 10 g/100 ml, and 5% of the boys and 8% of the girls had hematocrit levels less than 35. Negro and Chinese children had low hematocrit levels.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

New York

New York City

- Reference: Lawrence, C. and Klipstein, F. A.  
Megaloblastic Anemia of Pregnancy in New York City.  
Ann. Internal Med. 66: 25, 1967.
- Subjects: 24 patients with megaloblastic anemia of pregnancy.  
7 Negroes, 7 Caucasians, 10 from Caribbean area.
- Methods: Examination of marrow aspirates for megaloblastic changes,  
determination of hemoglobin, white blood cells, platelets,  
serum vitamin B<sub>12</sub>, serum folate.

Nutritional

- Status: Serum folate concentrations were subnormal in 83% of  
patients with megaloblastic anemia and in 26% of a group  
of 50 nonanemic pregnant women. A deficiency of vitamin  
B<sub>12</sub> was probably not a factor in the pathogenesis of  
anemia as only 2 patients with anemia could be definitely  
shown to have low serum B<sub>12</sub> activity.

New York City

- Reference: Haughton, J. G.  
Nutritional Anemia of Infancy and Childhoos. Am. J.  
Public Health 53: 1121, 1963.
- Subjects: 286 preschool children, mostly Puerto Ricans or Negroes  
in families with medium incomes. 75.5% Puerto Rican,  
15% Negro, 9.5% white. Incomes from \$2500 to \$3400.
- Methods: Hemoglobin in blood.
- Nutritional
- Status: Hemoglobin levels below 10 g/100 ml were found in 54  
children (19%), mostly under 2 years of age. In all  
but 2 of them, anemia was hypochromic, microcytic.  
The percentage was approximately the same in all 3  
racial groups.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

New York  
Syracuse

Reference: Benjamin, F., Bassen, F. A., and Meyer, L. M.  
Serum Levels of Folic Acid, Vitamin B<sub>12</sub>, and Iron in  
Anemia of Pregnancy. Am. J. Obstet. Gynecol. 96: 310,  
1966.

Subjects: 1052 consecutive unselected pregnant women.

Methods: Hemoglobin, iron, folic acid, and vitamin B<sub>12</sub> in blood.

Nutritional  
Status: Forty nine percent had hemoglobin levels between 10 and  
12 g/100 ml; 23% had less than 10 g/100 ml. Of those  
with less than 10 g/100 ml, 130 were investigated in  
more detail and of those, 80% had less than 50 µg of  
iron/100 ml serum, 65% had less than 4 µg folate, and  
31% had less than 100 µg of vitamin B<sub>12</sub>/ml serum.

Syracuse

Reference: Brin, M., Dibble, M. V., Peel, A., McMullen, E.,  
Bourquin, A., and Chen, N.  
Some Preliminary Findings on the Nutritional Status of  
the Aged in Onondaga County, New York. Am. J. Clin.  
Nutr. 17(4): 240, 1965.

Subjects: 234 well men and women, average age 71 yrs.

Methods: Hematocrit, blood vitamin A, and ascorbic acid, urinary  
thiamine and riboflavin, transketolase activity of  
erythrocytes.

Nutritional  
Status: in 8% of the population, blood ascorbic acid levels were  
in deficient range. Vitamin A in blood was acceptable  
and high. From 6-18% of group were deficient in thiamine.  
None were deficient in riboflavin. Conclusion was that,  
on the whole, the group was fairly well nourished. The  
average hematocrit was 42.3%. Five percent of the men  
and 13% of the women had low hematocrits.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

New York  
Syracuse

Reference: Brin, M., Schwartzberg, S. H., and Arthur-Davies, D.  
A Vitamin Evaluation Program as Applied to 10 Elderly  
Residents in a Community Home for the Aged. J. Am.  
Geriatr. Soc. 12: 493, 1964.

Subjects: 10 men, 62-96 yrs.

Methods: Food composite made for 6 days and thiamine content  
estimated. Two 24-hr. urinary collections. 2 venous  
blood samples. Ascorbic acid estimated in blood plasma,  
thiamine in red cells. Thiamine, riboflavin, N<sup>1</sup>-methyl-  
nicotinamide, and Xanthurenic acid were estimated in  
the urine.

Nutritional

Status: Indications were that the thiamine intake was low; in 4,  
in the deficiency range as determined by thiamine level  
in urine and erythrocyte transketolase activity in blood.  
Levels of thiamine in the diet were also low. The urinary  
excretion of riboflavin and xanthurenic acid and the  
plasma levels of ascorbic acid showed that riboflavin,  
vitamin B<sub>6</sub>, and ascorbic acid were present in adequate  
amounts. The excretion of N<sup>1</sup>-methylnicotinamide was low  
in 5, but not in the deficiency range.

## NUTRITIONAL STATUS STUDIES--continued

### NORTHEAST--continued

#### New York Syracuse

- Reference: Dibble, M. V., Brin, M., McMullen, E., Peel, A., and Chen, N.  
Some Preliminary Biochemical Findings in Jr. High School Children in Syracuse and Onondage County, New York. Am. J. Clin. Nutr. 17(4): 218, 1965.
- Subjects: 122 Negro, 282 white children, 12-15 yrs. 1/2 boys, 1/2 girls. Varied economic groups. In first school, children predominantly Negroes, most of fathers, laborers. At second school, predominantly white children, 44% from professional and managerial groups and 25% white collar workers. At third school, predominantly white children, mostly skilled and unskilled laborers.
- Methods: Breakfast intake recorded and calories, protein, iron, thiamine, riboflavin, and ascorbic acid calculated. Height, weight, skinfold thickness. Glucose, hematocrit, ascorbic acid, transketolase activity in blood. Thiamine, riboflavin, and folic acid in urine.
- Nutritional Status: The average intake of all nutrients estimated was lowest for pupils at the first and highest for those at the second school. A greater proportion of children at the first school were classified as moderately short; in addition, their percent average weight as a group was the lowest. Subjects from the first school had a slightly lower average hematocrit, largely due to the females in the school. Blood glucose levels were in the normal range for all subjects from the 3 schools. One-third of the children in the first school had less than acceptable ascorbic acid in blood. Thiamine in urine was within acceptable limits except for girls in the first school. Riboflavin and folic acid in urine were of acceptable levels.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

New York  
Syracuse

Reference: Dibble, M. V., Brin, M., Thiele, V. F., Peel, A., Chen, N., and McMullen, E.  
Evaluation of the Nutritional Status of Elderly Subjects, with a Comparison Between Fall and Spring. J. Am. Geriat. Soc. 15: 1031, 1967.

Subjects: 214 men and women over 50 yrs., 78% from 61-80 yrs., living in public housing.

Methods: Height, weight, skinfold thickness. Hematocrit, blood ascorbic acid, vitamin A, and transketolase activity. Urinary thiamine and riboflavin. Dietary intake data obtained for fall group, calories and 6 nutrients calculated.

Nutritional  
Status:

Iron, thiamine, and riboflavin were at suboptimal levels in 43, 41, and 17%, respectively, of the total group. At least 50% of the subjects in the fall group consumed at least 2/3 of the recommended allowances for calories, protein, iron, vitamin A, ascorbic acid, thiamine, and riboflavin, with the exception of ascorbic acid for men. Sixty seven percent of the females and 46% of the males were 10% or more overweight; 9% of the females and 19% of the males were 10% or more underweight.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

Pennsylvania  
Pittsburgh

Reference: Danneker, Dale  
Study of Hemoglobin Levels of Children Attending Child Health Conferences, Allegheny Health Department, Pittsburgh, Pa. 1966. Unpublished Report.

Subjects: 342 well children from families of low socio-economic status - age range: 6 months to 3 years.

Methods: Spencer Hemoglobinometer used to make hemoglobin determination.

Nutritional Status: Fifty six of the 342 children (16.4%) had hemoglobin levels of 10 gm/100 ml or less and were considered anemic. Assumed this anemia was due to primary iron deficiency as subjects responded to iron therapy.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

Pennsylvania  
Pittsburgh

- Reference: Rogers, K. D. and Reese, G.  
Health Studies--Presumably Normal High School Students.  
1. Physical Appraisal. Am. J. Diseases Children 108:  
572, 1964.
- Subjects: 488 male, 497 female students, 14-19 yrs. living in  
Dormount, middle-class, all-white suburb of Pittsburgh.
- Methods: Detailed medical examinations, including height, weight,  
chest expansion, resting pulse rate, systolic blood  
pressure, dental examination, hematocrit, and blood  
sugar estimations.

Nutritional

Status: Approximately 6% of the males and 8% of the females were  
moderately overweight. Five percent and 10%, respectively,  
were markedly overweight. Two percent of the males and  
3% of the females were moderately underweight. Less than  
1% and 2%, respectively, were markedly underweight.  
Chest expansion was inversely related to body weight in  
both sexes, and directly related to height in males but  
not in females. In males, resting pulse rate was directly  
related to body weight and inversely related to height;  
in females no significant association was found. No  
males, and 2.5% of the females had enlargement of the  
thyroid. Teeth were "essentially normal" in 70% of males  
and 67% of females. Ten females had hematocrits of 40%  
or below; 11 males had values of 44% or below. Seven  
pupils had fasting blood sugar levels considered to be  
abnormally elevated. One was a known diabetic. The  
others on retest were within the normal range.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

Vermont  
Burlington

- Reference: Morse, E. H., Merrow, S. B., and Clarke, R. F.  
Some Biochemical Findings in Burlington (Vt.) Junior  
High School Children. Am. J. Clin. Nutr. 17(4): 211,  
1965.
- Subjects: 401 children, 12-15 yrs. 225 boys, 176 girls. 22% boys  
and 29% girls low income area.
- Methods: A single collection of blood and urine samples made.  
Food intake on the morning of the day of collection  
recorded. Hemoglobin, hematocrit, ascorbic acid,  
vitamin A, transketolase, thiamine, and cholesterol  
in blood. Thiamine and riboflavin in urine.
- Nutritional  
Status: Marginal vitamin deficiency was limited to small  
percentage. About 1/3 had low blood ascorbic acid  
content. Vitamin A content of blood was normal.  
Thiamine intake judged to be low in 10% of boys and  
25% of girls as determined by the transketolase assay.  
The majority had good levels of hemoglobin; only one  
boy and 3 girls had less than 12 g/100 ml. Hematocrit  
values were largely good; only one boy and 2 girls had  
hematocrit below 36%. Riboflavin in the urine was high  
for most subjects. No attempt was made to align  
cholesterol values with any definitive standard. No  
values are given for food intake.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

Vermont

Burlington

- Reference: Merrow, S. B.  
Triceps Skin-Fold Thickness of Vermont Adolescents.  
Am. J. Clin. Nutr. 20(9): 978, 1967.
- Subjects: 557 males and females, 12-15 yrs. 296 boys and 261 girls.  
All subjects white and 88% classified themselves as of  
American, French-Canadian, or British Isles origin.
- Methods: Height, weight, and skinfold thickness at the triceps.
- Nutritional  
Status: Twenty percent or more of each age and sex group were  
classified as obese according to criteria proposed by  
Seltzer and Mayer. Although the subjects were about  
the same height as other North American groups of the  
same sex and age, the males were somewhat heavier.

NUTRITIONAL STATUS STUDIES--continued

NORTHEAST--continued

Vermont  
Burlington

Reference: Wakefield, L. M. and Merrow, S. B.  
Interrelationships between Selected Nutritional, Clinical,  
and Sociological Measurements of Preadolescent Children  
from Independent Low Income Families. Am. J. Clin.  
Nutr. 20(4): 291, 1967.

Subjects: 134 children, 6-12 yrs. Low income families.

Methods: Nutrient intake for 7 days kept by the mother; skinfold  
thickness, physical activity, protein-bound iodine,  
hemoglobin, and serum cholesterol.

Nutritional

Status: The children were certified as healthy on the basis of  
the physical examination, hemoglobin, and protein-bound  
iodine determination. Twenty percent of the males and  
14% of the females were underweight; 26% of the males  
and 20% of the females were overweight. Underweight  
and overweight groups had a poorer nutrient intake than  
the average weight group. The underweight and overweight  
groups were below the NRC Recommended Dietary Allowances  
in 7 and 6 nutrients, respectively, while the average  
weight group was below in only 3 nutrients. The under-  
weight group had less than 90% of the recommended  
allowances of calories, protein, calcium, iron, vitamin  
A, niacin, and ascorbic acid; the overweight group had  
less than 90% of calcium, iron, vitamin A, thiamine,  
riboflavin, and ascorbic acid. All 3 groups obtained  
less than 90% of the recommended allowances for calcium,  
vitamin A, and ascorbic acid.

## NUTRITIONAL STATUS STUDIES--continued

### NORTH CENTRAL

#### Dakotas

#### Indian boarding schools for Sioux children

**Reference:** Wenberg, B. G., Boedeker, M. T., and Schuck, C.  
Nutritive Value of Diets in Indian Boarding Schools in  
the Dakotas. Observations of Growth and Development of  
Adolescent Sioux Indian Girls. J. Am. Dietet. Assoc.  
46: 96, 1965.

**Subjects:** Children in 8 Indian boarding schools for Sioux, 7-14  
yrs. Oldest group, adolescent girls, 12-14 yrs.,  
additional observations made.

**Methods:** 7-day and 5-day dietary observations. Nutritive value  
of diets estimated from inventories of foods available  
and observations at meal time. Height, weight, and  
hemoglobin determinations of 12-14 yr.-old girls.

#### Nutritional

**Status:** Diets of the 7-8 year olds were within NRC Recommended  
Dietary Allowances for all nutrients except ascorbic  
acid (nutrients were frequently low in diets of 12-14  
year old groups). Mean height of the 12-14 year old  
girls fell within the "short" classification of Stuart  
and Meredith standards, but mean weight was close to  
average. Mean hemoglobin values were 11.65 g/100 ml  
blood, indicating that anemia was not a problem.

## NUTRITIONAL STATUS STUDIES--continued

### NORTH CENTRAL--continued

#### Iowa

##### State-wide Study

- Reference: Hodges, R. E. and Krehl, W. A.  
Nutritional Status of Teenagers in Iowa. Am. J. Clin.  
Nutr. 17(4): 200, 1965.
- Subjects: 2045 teenagers. Population of Iowa primarily Northern  
and middle European extraction. Stable, high socio-  
economic level.
- Methods: Brief physical examination, height, and weight. 1/2 had  
detailed physical examination, blood, and urine samples  
for biochemical tests; 1/2 of these, detailed dietary  
history.
- Nutritional  
Status: The average teenager was healthy, but a significant  
minority had physical lesions and biochemical abnor-  
malities. A sizable number, especially those who skip  
breakfast, had low intakes of ascorbic acid. A minority  
had a low intake of iron. The consumption of dairy  
products, sugar, candy, and soft drinks was high.  
Detailed analysis of data to be reported at a later time.

#### Indiana

##### Indianapolis

- Reference: Hunter, C. A., Jr.  
Iron-Deficiency Anemia in Pregnancy. Surg. Gynecol.  
Obstet. 110: 210, 1960.
- Subjects: 4744 patients admitted to obstetrical service.
- Methods: Hemoglobin levels in blood.
- Nutritional  
Status: In 4744 patients, 852 had moderate anemia with hemoglobin  
values of 9 to 11 g/100 ml; 89 had severe anemia, with  
hemoglobin values of less than 9 g/100 ml.

NUTRITIONAL STATUS STUDIES--continued

NORTH CENTRAL--continued

Ohio

Columbus

Reference: Skillman, T. G., Hamwi, G. J., and May, C.  
Nutrition in the Aged. Geriat. 15: 464, 1960.

Subjects: 200 patients, over 65 yrs.

Methods: Heights, weights, medical examination, estimated dietary intake.

Nutritional

Status: Of 200 patients, 68% were more than 10% overweight. Eight percent were more than 10% underweight. Of 101 hospitalized elderly patients, ascorbic acid nutrition was poor. Nutrition status with regard to protein, calories, calcium, iron, vitamin A, thiamine, and riboflavin was good.

Columbus

Reference: Shaw, R. and Robertson, W. O.  
Anemia Among Hospitalized Infants. Ohio Med. J. 60: 45, 1964.

Subjects: 797 infants, 6-24 mo. 479 male, 318 female, White, 679, nonwhite, 117. Admission classification: private with insurance, 342; private without insurance, 186; service, 216; state, 46; Welfare, 2; other, 2; not recorded, 3.

Methods: Medical examination, hemoglobin level in blood.

Nutritional

Status: Twenty five percent of the subjects had low hemoglobin levels indicative of iron deficiency. There was no indication of ascorbic acid or vitamin D deficiency. For entire group, significant associations were found for occurrence of anemia with race, lower socio-economic class and grossly inadequate diet.

## NUTRITIONAL STATUS STUDIES--continued

### SOUTH--continued

#### Alabama Birmingham

- Reference: Cloud, Harriet Holt  
Heights, Weights, Triceps Skinfold Measurements,  
Hematocrits, and Dietary Intake of Four Year Old  
Children in Day Care Centers and at Home in  
Birmingham, Jefferson County, Alabama, 1967. Thesis,  
Department of Nutrition, Graduate School of the  
University of Alabama, University, Alabama.
- Subjects: 50 white and Negro boys and girls from low income  
families selected from 7 day care centers; 46 white and  
Negro boys and girls selected from child health clinics  
in the 5 health centers of Birmingham. Age range: 4  
year old (criteria 3 year, 6 month to 4 year, 5 month,  
20 days).
- Methods: Three-day diet records completed by mother for subjects  
cared for at home. Three-day records kept by mother  
and day care center for children cared for in this  
manner. Tricep skinfold, height-weight measurements  
and hematocrit determinations. Compared the group  
cared for at home with the children in day care.
- Nutritional  
Status: The anthropometric measures and hematocrit levels were  
similar for the two groups. The means were 40.2 inches  
and 40.7 inches for height; 35.8 and 37.1 pounds for  
weight, 8.2 and 8.0 mm for tricep skinfold, and 35.6 and  
35.3 vol percent for hematocrit for the day care and child  
health children respectively. Consistent differences  
between the white and Negro children shown.
- Mean nutrient intakes were higher for day care groups  
in every nutrient than for child at home.

NUTRITIONAL STATUS STUDIES--continued

SOUTH

Alabama

North Central section

Reference: Dreizen, S., Spirakis, C. N., and Stone, R. E.  
Undernutrition Slows Growth of Adolescents. J. Pediat.  
70: 256, 1967.

Subjects: 30 undernourished and 30 well-nourished girls, from  
early childhood to early adulthood. White, native-born,  
of British extraction.

Methods: Longitudinal study of growth and maturation. Food  
preparation and intake records.

Nutritional

Status: Chronic undernutrition retards skeletal growth and  
maturation, postpones menarche, and extends the length  
of the growth period. There was no significant  
distinction in adult stature between groups, indicating  
that sustained substandard nutrition did not have a  
detectable imprint on the size of the mature skeleton.  
The undernourished girls had diets most deficient in  
ascorbic acid, vitamin A, calcium, iron, and animal  
protein. The well-nourished, healthy girls had diets  
which consistently provided all of the Recommended  
Dietary Allowances.

NUTRITIONAL STATUS STUDIES--continued

SOUTH--continued

District of Columbia

Reference: Gutelius, Margaret F.  
The Problem of Iron Deficiency Anemia in Preschool Negro Children. Child Health Center of Children's Hospital in Washington, D. C. Unpublished Report.

Subjects: 460 preschool children were tested from approximately 800 who attended the clinics in 1965. Age range: 2 months to 5-1/2 years.

Methods: Hemoglobin concentrations were measured by the cyanmethemoglobin method with the Coleman-Junior spectrophotometer.

Microhematocrits were spun for 5 minutes in an International Micro-Capillary Centrifuge.

When hemoglobin level was below 10.0 gm per 100 ml, a smear for red cell pathology was examined.

Nutritional  
Status:

In these 460 children, the mean hemoglobin concentration was 10.40 gm per 100 ml; the mean hematocrit 32.5%. The lowest findings were in the children from 12 to 17 months of age whose mean hemoglobin level was 9.11 gm per 100 ml and the mean hematocrit 29.9%.

Iron deficiency anemia, i.e., hemoglobin below 10.0 gm per 100 ml with corroborative evidence on smear for red cell pathology was found in 133 children or 2.9%. The incidence of iron deficiency anemia reached a peak of 65.0% in the children from 12 to 17 months of age and then fell off rapidly in the older age group.

NUTRITIONAL STATUS STUDIES--continued

SOUTH--continued

Florida

Okeechobee Project

Reference: Browning, R. A. and Northcutt, T. J., Jr.  
On the Season. Florida Bd. of Health Monograph No. 2,  
1961, and  
Delgado, G., Brumback, C. L., and Deaver, M. B.  
Eating Patterns Among Migrant Families. Public Health  
Rept., Washington 76: 349, 1961.

Subjects: 35 families of Negro agricultural workers who spend  
about 7 months a year at a migrant labor camp.

Methods: Heights, weights, and physical examination of children.  
Dietary study of 35 families. Evaluation of 3-day  
diet records of 37 children in the 5th grade.

Nutritional

Status: Heights and weights of children fell in the lower  
percentile on the Stewart Grid. Some children showed  
evidence of scurvy, rickets, nutritional anemias, and  
marasmus. One case of kwashiorkor was found.

The consumption of milk and milk products, green and  
yellow vegetables, and citrus and other fruits was  
inadequate. Starches, fats, and sweets were consumed  
in larger amounts than recommended for good diets. In  
a large percentage of families, the foods consumed  
furnished less than 1/2 of the NRC Recommended Dietary  
Allowances for ascorbic acid, 69% of families; vitamin A,  
42%; riboflavin and calcium, 26%. Only 6% fell below 1/2  
the NRC-RDA for protein and calories.

## NUTRITIONAL STATUS STUDIES--continued

### SOUTH--continued

#### Georgia Atlanta

Reference: Taylor, R. D. and Swartwout, J. R.  
Biochemical Survey of Protein Sufficiency During Pregnancy  
in Urban Women. Obstet. and Gynecol. 29: 244, 1967.

Subjects: 57 indigent patients, 11 wives of medical students and  
house staff, 10 private patients. All given multivitamin  
and iron supplements.

Methods: Ratio of urea nitrogen to creatinine content of urine  
used as estimation of protein intake.

Nutritional  
Status: Indication is that the wives of medical students and  
staff as well as the indigent patients had low protein  
intake as compared to the private patients. Urinary  
ratios of urea nitrogen to creatinine for private  
patients was 6.11, for wives of medical students and  
staff 4.04, and for indigent patients 3.02.

#### Louisiana Charity Hospital of Louisiana at New Orleans

Reference: Henington, V. M., Caroe, E., Derbes, V., and Kennedy, B.  
Kwashiorkor. Report of Four Cases from Louisiana. Arch.  
Dermatol. 78: 157, 1958.

Subjects: 4 Negro patients (children), 3 from 1 family.

Methods: Clinical and social histories are described in detail.

Nutritional  
Status: Four Negro children entered the hospital with Kwashiorkor,  
3 were from one family. These cases are believed to be  
the first reports of Kwashiorkor in the United States.  
All responded to treatment with diets rich in protein.

## NUTRITIONAL STATUS STUDIES--continued

### SOUTH--continued

#### Georgia

Reference: Bellhouse, Helen W. and Terrell, James  
Utilization of Post Neonatal Death Certificates in a  
Study of Needs. 1964. Unpublished Report.

Subjects: 222 mothers whose infants died neonatally.

Methods: A retrospective study of circumstances surrounding the  
excessively high post-neonatal mortality rate. Using  
a structured questionnaire, senior medical students  
interviewed family members, health department personnel,  
private physicians, and hospital personnel. 29 selected  
counties of Georgia in sample.

#### Nutritional Status:

Diagnosis of the 208 mothers who received medical  
supervision indicated 36 had hypertension; 49 had  
hemoglobin less than 10 grams per 100 ml, indicative  
of anemia.

Diet information was available for about 24% of the  
mothers. Eighty percent of the mothers took vitamins  
and 82% took supplementary iron.

Cravings during pregnancy for such things as chalk,  
clay, and cornstarch was reported by 64%.

Because of the early age of these infants at death, only  
formula or breast milk were tabulated--13.1% of infants  
were breast fed; 50.9 were entirely formula fed while  
34.7 were both bottle fed and breast fed.

One-half of patients were medically indigent.

NUTRITIONAL STATUS STUDIES - Continued

SOUTH - Continued

Louisiana

Charity Hospital of Louisiana at New Orleans

- Reference: Henington, V.M., Caroe, E., Derbes, V. and Kennedy, B. "Kwashiorkor. Report of Four Cases from Louisiana." Arch. Dermatol. 78: 157-170, 1958
- Subjects: 4 Negro patients (children), 3 from 1 family.
- Methods: Clinical and social histories are described in detail.
- Nutritional Status: 4 Negro children entered the hospital with Kwashiorkor, 3 from one family. These cases are believed to be the first reports of Kwashiorkor in the United States. All responded to treatment with diets rich in protein.

Texas

Dallas area

- Reference: Scott, D.E. and Pritchard, J. A. "Iron Deficiency in Healthy Young College Women." J. Amer. Med. Assoc. 199: 897-900, 1967
- Subjects: 114 healthy white women, 19-25 yrs. Somewhat privileged socio-economically.
- Methods: Iron status evaluated from examination of blood and bone marrow. Stainable marrow iron was aspirated from both iliac crests of 22 subjects. Amount of iron available for hemoglobin synthesis was estimated by quantitative phlebotomy in 11 women. Hemoglobin, hematocrit, serum iron and transferrin saturation were evaluated as measures of iron stores.
- Nutritional Status: Iron stores were scant or absent in 2/3 of the subjects in which evaluations were made of marrow-stainable iron and quantitative phlebotomy. The mean values for hemoglobin, hematocrit, serum iron and transferrin saturation were lower for women with no stainable iron in the bone marrow but individual values overlapped those of women with stainable iron. Hemoglobin does not appear to be a good measurement of iron stores. Serum iron and transferrin saturation correlated with iron stores.

NUTRITIONAL STATUS STUDIES--continued

SOUTH--continued

Maryland  
Baltimore

Reference: Stine, A. C., Saratsiotis, J. B., and Furno, O. F.  
Appraising the Health of Culturally Deprived Children.  
Am. J. Clin. Nutr. 20(10): 1084, 1967.

Subjects: 842 children, 4th birthday 6 months before or after  
measurements. From neighborhoods below the median  
economic level of the city. Fulfilled at least 3 out  
of 10 criteria of a culturally deprived home. Girls  
and boys, white and nonwhite.

Methods: Hematocrit, height, weight, skinfold thickness, and  
other physical characteristics were considered. Trained  
psychometrists administered the Columbia Mental Maturity  
Test to each child.

Nutritional  
Status: Median values for height and weight are below those of  
standard population and closer to those of malnourished  
groups of underdeveloped countries. Twenty percent of  
Negro males had red cell volumes that warrant evaluation  
for anemia. Ten percent of white females were obese.  
Negroes were significantly taller than whites. White  
children had significantly higher red blood cell volumes,  
thicker skinfolds, and higher mental ability scores than  
Negro children.

## NUTRITIONAL STATUS STUDIES--continued

### SOUTH--continued

#### Oklahoma

##### Seminole County

Reference: Mayberry, R. H. and Lindeman, R. D.  
A Survey of Chronic Disease and Diet in Seminole  
Indians in Oklahoma. Am. J. Clin. Nutr. 13: 127, 1963.

Subjects: 302 Seminole Indians in Oklahoma of average age 33.5 yrs.  
221 Seminole Indians in Florida of average age 36.2 yrs.  
422 white people in Oklahoma of average age 44.2 yrs.  
All were over 14 yrs.

Methods: Height, weight, hemoglobin and cholesterol levels in  
blood, blood pressure, incidence of diabetes, dietary  
habits, causes of deaths reported 1950-1959.

#### Nutritional Status:

Indians were shorter and heavier than white subjects.  
Mean blood pressure determination and serum cholesterol  
levels were similar in Indian and white subjects.  
Dietary habits were similar except that Indians rarely  
drank milk, had a slightly higher ratio of polyunsaturated  
to saturated fats and higher energy intake than whites.  
Hemoglobin concentration was comparable in white and  
Indian women, but slightly higher in Indian than in  
white men. Incidence of diabetes and of raised blood  
sugar levels was greater among Indian than among white  
subjects. Coronary artery disease was a more frequent  
cause of death for whites than for Indians. Stroke,  
hypertension, and diabetes were more frequent causes  
of death for Indians than for whites.

NUTRITIONAL STATUS STUDIES--continued

SOUTH--continued

South Carolina  
Greenville

Reference: Jones, R. E. and Schendel, H. E.  
Nutritional Status of Selected Negro Infants in  
Greenville County, South Carolina. Am. J. Clin.  
Nutr. 18: 407, 1966.

Subjects: 36 Negro infants, 4-10 mo. Low income group. Maximum  
total annual family income \$3000.

Methods: Blood samples taken by venipuncture. Body weight,  
serum albumin, globulin and total protein, serum  
ascorbic acid.

Nutritional  
Status:

About 1/3 of the infants had indices of poor nutrition status with respect to protein and ascorbic acid and low body weight. One infant had only 2.7 grams albumin per 100 ml serum; 10 had marginally low levels with a mean of 3.34 grams per 100 ml; 24 had satisfactory values with a mean of 3.85 grams per 100 ml. Eight infants had serum ascorbic acid levels below 0.3 mg per 100 ml, with a mean of 0.18; 4 infants had moderately low values with a mean of 0.42 mg per 100 ml; 24 infants had satisfactory levels of serum ascorbic acid with a mean value of 1.39 mg per 100 ml. Serum globulin and total serum protein were considered unsatisfactory criteria of status of protein nutrition.

## NUTRITIONAL STATUS STUDIES--continued

### SOUTH--continued

#### Texas Dallas area

Reference: Scott, D. E. and Pritchard, J. A.  
Iron Deficiency in Healthy Young College Women. J. Am.  
Med. Assoc. 199: 897, 1967.

Subjects: 114 healthy white women, 19-25 yrs. Somewhat  
privileged socio-economically.

Methods: Iron status evaluated from examination of blood and bone  
marrow. Stainable marrow iron was aspirated from both  
iliac crests of 22 subjects. Amount of iron available  
for hemoglobin synthesis was estimated by quantitative  
phlebotomy in 11 women. Hemoglobin, hematocrit, serum  
iron and transferrin saturation were evaluated as  
measures of iron stores.

#### Nutritional

Status: Iron stores were scant or absent in 2/3 of the subjects  
in which evaluations were made of marrow-stainable iron  
and quantitative phlebotomy. The mean values for hemo-  
globin, hematocrit, serum iron and transferrin saturation  
were lower for women with no stainable iron in the bone  
marrow, but individual values overlapped those of women  
with stainable iron. Hemoglobin does not appear to be a  
good measurement of iron stores. Serum iron and transferrin  
saturation correlated with iron stores.

#### Virginia

#### Out patient clinics and homes for elderly

Reference: Hollifield, G. and Parson, W.  
Overweight in the Aged. Am. J. Clin. Nutr. 7: 127, 1959.

Subjects: 681 people over 65 yrs., 474 men and 207 women. Less  
than 10% Negroes. None had debilitating disease.

Methods: Body weight and weight history studied.

#### Nutritional

Status: Eleven percent of the men and 16% of the women were  
above the average weight for height and age by 20% or  
more. Average weight tended to fall after age 75.

## NUTRITIONAL STATUS STUDIES--continued

### WEST

#### Alaska

Reference: Interdepartmental Committee on Nutrition for National Defense.  
An Appraisal of the Health and Nutritional Status of the Eskimo: Alaska. Dept. Defense, Washington, D. C., 1959.

Subjects: Eskimos, Indians, and Aleuts of Alaska.

Methods: Records of foods eaten were evaluated for nutrient intake. Clinical examination of 805 village inhabitants. Biochemical survey in which blood and urine analyses were carried out on 826 adult males, 145 adult females, and 209 children.

#### Nutritional Status:

Intake of vitamin A averaged 1621 I.U. per person per day and intake of ascorbic acid 36 mg, both below 2/3 of Recommended Dietary Allowances. Descriptions of foods eaten by villagers and results of analyses of 75 Alaskan foods are reported.

In clinical examinations Bitot's spots were occasionally noted. Dental caries varied in incidence to proximity of villages to principal centers of population. No signs of scurvy noted.

Hemoglobin was slightly low. Vitamin A and carotene in serum were below acceptable range. Serum ascorbic acid levels, and values for cholesterol, phospholipids, and total fatty acids in blood were in normal range. Urinary excretions of N<sup>1</sup>-methylnicotinamide, thiamine, and riboflavin were in acceptable range.

NUTRITIONAL STATUS STUDIES--continued

WEST--continued

Arizona

Pima Indian Reservation south of Phoenix

Reference: Hesse, F. G.  
A Dietary Study of the Pima Indian. Am. J. Clin. Nutr.  
7: 532, 1959.

Subjects: 51 adult Pima Indians.

Methods: Dietary recall. Blood cholesterol on fasting blood  
samples from 39 subjects.

Nutritional

Status: Only 16% of the protein was of animal origin. Calcium,  
vitamin A, and riboflavin intakes were insufficient.  
No evidence of vitamin deficiency was present. One-  
fourth of caloric intake from fat, mostly saturated.  
Mean blood cholesterol was  $205 \pm 65.3$  mg/100 ml, within  
normal range of the U.S.

NUTRITIONAL STATUS STUDIES--continued

WEST--continued

California  
Berkeley

Reference: Huenemann, R. L., Hampton, M. C., Shapiro, L. R., and Behnke, A. R.  
Adolescent Food Practices Associated with Obesity.  
Federation Proc. 25: 4, 1966.

Subjects: 950 teenagers. 10% Oriental, 30% Negro, almost all remainder Caucasian. Observations began when in 9th grade, continued through 12th grade.

Methods: 7-day record of food intake. Body composition by the "body envelope" method.

Nutritional  
Status:

Mean intake of girls was lower than the recommended allowances for calcium, iron, and calories. Those from lower socio-economic groups had lower intakes of calories, protein, and ascorbic acid. There was more obesity in Negroes, particularly girls, than in whites. Intake of boys met recommended allowances for 7 nutrients; only calories were low.

San Francisco

Reference: Clarke, J. K. and Margen, S.  
Body Fat, Diet, and Physical Activity of Oriental College Women. Abstract of Paper given at 50th Ann. Meeting, Am. Dietet. Assoc., Chicago, Aug. 17, 1967.

Subjects: 40 college women of Asian ancestry.

Methods: 7-day diet records. Hemoglobin, serum vitamin A, and blood ascorbic acid levels on a subsample. Body fatness by several methods.

Nutritional  
Status:

Oriental women were leaner than Caucasian women. Several subjects had intakes of protein, iron, and calcium less than 2/3 of the recommended allowances. There was one case of borderline anemia. Blood vitamin A and ascorbic acid were within normal ranges for subjects measured.

## NUTRITIONAL STATUS STUDIES--continued

### WEST--continued

#### Montana

##### Blackfeet Indian Reservation

Reference: The Interdepartmental Committee on Nutrition for National Defense and the Division of Indian Health U. S. Public Health Service, DHEW.  
Nutrition Survey Blackfeet Indian Reservation August - September 1961.

Subjects: 1390 children and adults from nine locations on the reservation. 56% subjects were children, 10% were patients seen in clinics or hospitals, the remaining from the community.

Methods: All persons seen received clinical and dental examinations. 191 were given dietary evaluation by interview of food intake during preceding day. 263 individuals were evaluated by biochemical assessment.

#### Nutritional Status:

In significant segments of the study group, the levels of caloric intake, protein intake, and the dietary supply of calcium, iron, and vitamins A and C were borderline. Seasonal variations in vitamin A were noted in the fall and spring data. Manifestation of nutritional problems were encountered more frequently, and with greater severity, among group undergoing physiologic stress such as women during their reproductive years, particularly during pregnancy and lactation, as well as children in the infant and preschool age group.

Almost 22% of the adult population fell into the underweight classification of less than 90% of "standard weight" when compared to a normal North American population.

## NUTRITIONAL STATUS STUDIES--continued

### WEST--continued

#### Montana

##### Fort Belknap Indian Reservation

Reference: The Interdepartmental Committee on Nutrition for National Defense and the Division of Indian Health, U. S. Public Health Service, DHEW.  
Nutrition Survey of Fort Belknap Indian Reservation  
August-October 1961.

Subjects: 700 persons from general population including children of preschool and school age and adults from 9 locations on reservations.

Methods: In 1961 survey, abbreviated clinical examination, comprehensive dental examination were made on all subjects; 358 were further evaluated in a detailed physical manner, and 161 were interrogated by interviewers for 24 hour diet recall. 178 were evaluated by biochemical assessment.

A resurvey was made in 1962. On this occasion, dietary studies were made by home visits and samples obtained for chemical analysis.

#### Nutritional

Status: In significant segments of the study group, the levels of caloric intake, protein intake, and the dietary supply of calcium, iron, and vitamins A and C were borderline. Seasonal variations in vitamin A were indicated in the fall and spring data. Manifestations of nutritional problems were encountered more frequently, and with greater severity, amongst groups undergoing physiologic stress such as women during their reproductive years, particularly during pregnancy and lactation, as well as children in the infant and preschool age group.

Almost 30% of the adult population fell into the under-weight classification of less than 90% of "standard weight" when compared to a normal North American population.

NUTRITIONAL STATUS STUDIES--continued

WEST--continued

Utah

Brigham City

- Reference: McDonald, B. S.  
Gingivitis--Ascorbic Acid Deficiency in the Navajo.  
3. Dietary Aspects. J. Am. Dietet. Assoc. 43: 331,  
1963.
- Subjects: 282 Navajo Indian students, Intermountain Indian School.  
Ratio of girls to boys, 4:3. Age range 11-22 years.
- Methods: Ascorbic acid intake calculated from five 1-day diet  
records kept by students. Dental examination of gums.  
White blood cells and platelets analyzed for ascorbic  
acid.

Nutritional  
Status:

Mean dietary intake of ascorbic acid was 69 mg per day.  
The following proportion of students had less than 2/3  
of recommended allowance of ascorbic acid: 10% girls  
and 8% boys 11-12 years; 33% girls and 14% boys 13-15  
years; and 31% girls and 22% boys 16-22 years.

About 10% of the 2050 students in the school had  
gingivitis. Of the 282 subjects chosen for the study,  
186 had hemorrhagic hyperplastic gingivitis, 97 had  
healthy gums.

There was no correlation between recorded dietary  
intake of ascorbic acid and health of the gums. However,  
dietary supplementation with ascorbic acid contributed  
to healing of gingivitis in 10% of the students.

More students with gingivitis had white cell-platelet  
ascorbic acid values within the deficient and scorbutic  
levels than students without gingivitis. Supplementation  
of diets with ascorbic acid increased the white cell-  
platelet ascorbic acid to normal values.

## NUTRITIONAL STATUS STUDIES--continued

### WEST--continued

#### Washington Seattle

Reference: Monsen, E. R., Kuhn, I. N., and Finch, C. A.  
Iron Status of Menstruating Women. Am. J. Clin. Nutr.  
20(8): 842, 1967.

Subjects: 13 university women, 19-37 yrs.

Method: Dietary aliquots taken for 7 days. Iron content  
calculated and determined chemically. Biochemical  
measures of iron stores, iron absorption, and  
saturation of transferrin. Indices of anemia.

#### Nutritional

Status: No subjects had anemia; 4 had good iron stores, 3 fair.  
Five subjects had borderline iron deficiency.

#### Wyoming

#### Wind River Indian Reservation

Reference: Perkins, G. B. and Church, G. M.  
Report of Pediatric Evaluations of a Sample of Indian  
Children--Wind River Indian Reservation, 1957. Am. J.  
Public Health 50: 181, 1960.

Subjects: 214 children from under 1 to 12 years of age, belonging  
to 60 families of the Shoshone and Arapahoe tribes.

Method: Medical examination, hemoglobin level, hematocrit.

#### Nutritional

Status: Of 199 children, only 7 had less than 10 g hemoglobin  
per 100 ml blood, and for 195 the mean hematocrit value  
was 39%. Two were "malnourished" and 7 were obese.  
There was high incidence of respiratory infections,  
which might be due to ascorbic acid deficiency. No  
food intakes were reported and no biochemical tests of  
nutritional status except hemoglobin and hematocrit.

Arapahoe children were comparable in height and weight  
with their non-Indian counterparts, but Shoshone  
children were shorter and lighter.

NUTRITIONAL STATUS STUDIES--continued

PUERTO RICO  
Dona Elena

- Reference: Roberts, L. J.  
A Cooperative Nutrition Research Program for Puerto Rico. 1. Background and General Plan. J. Am. Dietet. Assoc. 44: 18, 1964.
- Subjects: Children and 24 adults in 100 homes.
- Methods: Clinical examination. Diet information on family intake was obtained from subjects.
- Nutritional Status: Diet lacked good quality protein, calcium, vitamin A, and riboflavin. Amounts of iron, thiamine, and niacin appeared adequate. Heights and weights of children were low for age. Conditions attributable to a riboflavin deficiency were seen in 2/3 of subjects with angular lesions or scars of the lips, 20% with cheilosis and 13% with nasal seborrhea. Seventy five percent of the subjects had gingivitis, mostly of moderate degree. All of these signs were more prevalent in 24 adults examined.

## NUTRITIONAL STATUS STUDIES--continued

### PUERTO RICO--continued

#### Barrio Naranjo, Moca

- Reference:** Fernandez, N. A., Burgos, J. C., Plough, I. C., Roberts, L. J., and Asenjo, C. F. Nutritional Status of People in Isolated Areas of Puerto Rico. Survey of Barrio Naranjo, Moca, Puerto Rico. Am. J. Clin. Nutr. 19: 269, 1966.
- Subjects:** 542 subjects examined clinically. 97%, biochemical tests. Ages, 0-60+, male and female. 20 families, dietary survey. Poverty-stricken area.
- Methods:** Survey included collection of clinical, biochemical, and dietary data. Intake of calories and 8 nutrients calculated. Blood: hemoglobin, hematocrit, total protein, albumin, vitamin A, and ascorbic acid. Urinary excretion of thiamine, riboflavin, and N<sup>1</sup>-methylnicotinamide.
- Nutritional Status:** Diet was basically deficient in calories, calcium, iron, vitamin A, and riboflavin. Ingestion of protein, thiamine, and niacin was adequate. Ascorbic acid intake was adequate except in infants and old men. Low heights and weights for age. Moderate anemia in infants and lactating women. A considerable number of subjects had low plasma vitamin A and ascorbic acid. Plasma protein values were satisfactory. Low excretion rates of riboflavin and of N<sup>1</sup>-methylnicotinamide were very common. Urinary excretion rates of thiamine were adequate in most subjects.

## NUTRITIONAL STATUS STUDIES--continued

### PUERTO RICO--continued

#### Manzanilla

Reference: Plough, I. C., Fernandez, N. A., and Angel, C. R. A Cooperative Nutrition Research Program for Puerto Rico. 2. Nutritional Status of the Population--Clinical and Laboratory Examinations. J. Am. Dietet. Assoc. 44: 22, 1964.

Subjects: 390 people from 70 families in Manzanilla, a small isolated community. 37% of men earned less than \$500 during year and only 16% earned as much as \$1000 or more (1960).

Methods: Evaluation of food consumption by dietary team; clinical examination. Blood samples used for hemoglobin, hematocrit, differential WBC count, vitamin A, and ascorbic acid. Tests on urine for thiamine, riboflavin, N<sup>1</sup>-methylnicotinamide, and creatinine.

#### Nutritional

Status: Short stature and slight underweight were prevalent. Intakes of protein and riboflavin were definitely low and probably those of thiamine and iron. Moderate anemias of the hypochromia type were common in women and children. Serum albumin levels tended to be low, especially in children. Serum levels of vitamin A and ascorbic acid were high though intakes were low. Urinary excretion rates of thiamine were low in 1/5, and of riboflavin in 1/2 of the population, but those of niacin were satisfactory.

## NUTRITIONAL STATUS STUDIES--continued

### PUERTO RICO--continued

#### Mavilla

- Reference: Fernandez, N. A., Burgos, J. C., Plough, I. C., Roberts, L. J., and Asenjo, C. F.  
Nutritional Status of People in Isolated Areas of Puerto Rico. Am. J. Clin. Nutr. 17: 305, 1965.
- Subjects: 306 persons examined clinically, 296 biochemically. Ages 0-60+, male and female. 87 persons, dietary survey. Poverty stricken area.
- Methods: Dietary survey of families, calories and 8 nutrients calculated. Clinical examination. Blood: hemoglobin, hematocrit, serum total protein, serum albumin, serum vitamin A, and ascorbic acid. Urine: thiamine, riboflavin, and N<sup>1</sup>-methylnicotinamide/g of creatinine.

#### Nutritional

- Status: In the dietary survey, intakes of total energy and fat were low and calcium and vitamin A were deficient. Intakes of protein, iron, ascorbic acid, and thiamine were adequate and those of niacin and riboflavin were borderline. Main clinical findings were low heights and weights and skin xerosis and hyperkeratosis associated with vitamin A deficiency. Undernutrition was prevalent. Thirty nine percent of the subjects had low blood vitamin A. Serum protein and ascorbic acid were satisfactory. Excretion of riboflavin was low in 28% and of N<sup>1</sup>-methylnicotinamide in 15%.

## NUTRITIONAL STATUS STUDIES--continued

### PUERTO RICO--continued Three Rural Communities

Reference: Plough, Irvin, Fernandez, Nelson, Angel, Charles R., and Roberts, Lydia.  
A Nutrition Survey of Three Rural Puerto Rican Communities. Boletin de la Asociacion Medica de Puerto Rico 55 (12A), 1963.

Subjects: 1716 people of all ages from 3 rural Puerto Rican communities.

Methods: Brief physical examination using methods of the Interdepartmental Committee on Nutrition for National Defense. Blood samples were obtained from all but a few people and urine samples from nearly all over 5 years of age. Stool specimen collected from 3/4 of them.

One day's weighed food intake was recorded on 1/4 of the total sample.

#### Nutritional Status:

Dietary studies revealed less than optimal intakes of calcium, vitamin A, and riboflavin, and perhaps other nutrients. The deficits were most marked in children three to ten years of age and in adult women. The intakes of sulfur amino acids were below the minimum requirement in children under two.

The only significant clinical finding was retardation of growth, most marked in preschool children under school age.

Laboratory findings of hypoalbuminemia in children and of low excretion rates of riboflavin, at all ages tested, supported dietary findings. Blood levels of vitamins A and C tended to be high. Hypochromic anemia of moderate degree was common in women and children.

NUTRITIONAL STATUS STUDIES--continued

VIRGIN ISLANDS

St. Thomas

- Reference: Nutritionists, Virgin Islands Department of Health. Height and Weights of Ninth Grade Students, St. Thomas, Virgin Islands 1967-68. Unpublished Report.
- Subjects: 231 ninth grade students in Charlotte Amalie High School 1967-68 enrolled in 16 ninth grade classes. Age range was 13 to 18 years. 137 boys, 144 girls.
- Methods: Height, weight measurements taken by school nurse as one phase of physical examination procedure.
- Nutritional Status: Twenty three percent of the girls were 10 pounds above average weight and 26% of them were underweight by this standard. Twenty nine percent of the boys were 10 pounds above average weight and 29% were 10 pounds underweight.

These measurements were compared with height and weight measurements of boys and girls in 1964 and 1967 by sex and age. Expected gains in height and weight were obvious. Since 1954 these boys and girls have been exposed to programs which would benefit nutrition. Nonfat milk and multi-vitamins were distributed in well child clinics.

Nonfat milk is made available to the prenatal patients. Educational programs are provided to parents in prenatal and well child clinics as well as to professional groups. Nutrition education programs are conducted in schools.

## DIETARY STUDIES

### UNITED STATES

#### Nationwide

- Reference: Filer, L. J. and Martinez, G. A.  
Caloric and Iron Intake by Infants in the United States.  
An Evaluation of 4000 Representative Six-Month-Olds.  
Clin. Pediat. 2: 470, 1963.
- Subjects: 4310 six-month-old infants, born Dec. 1961 and Apr. 1962.
- Methods: Questionnaire to mothers about 24-hr. food intake.  
Caloric and iron intake calculated.
- Dietary  
Evaluation: Average daily intake of calories was 803, but standard deviations were large. Milk provided 70% of the daily energy. Average daily iron intake was 8.9 mg. (S.D. of 6.7 mg.). Cereal provided 1/2 the iron, and vegetables were a more important source than egg or fruit. At least half these infants were getting significantly less iron than the 1.5 mg/kg/day recommended by the Committee on Nutrition of the American Academy of Pediatrics.

#### Nationwide

- Reference: Filer, L. J., Jr. and Martinez, G. A.  
Intake of Selected Nutrients by Infants in the United States: an Evaluation of 4,000 Representative Six-Months-Olds. Clin. Pediat. 3: 633, 1964.
- Subjects: 4146 infants in a representative national sample.  
Average age, 6-8 months; weight, 18.4 pounds.
- Methods: Calculated daily intake of nutrients. Dietary information obtained from mother. Calories and 11 nutrients calculated.
- Dietary  
Evaluation: For all nutrients except iron, mean intakes were well above recommended amounts. Less than 1/4 of the infants attained the level of iron intake recommended by the Committee on Nutrition of the American Academy of Pediatrics.

## DIETARY STUDIES--continued

### UNITED STATES--continued

#### Interregional

Reference: Economic Research Service, ARS, USDA  
Food Consumption and Dietary Levels Under the Pilot Food Stamp Program, Detroit, Michigan, and Fayette County, Pennsylvania. Agric. Economic Report No. 9, June 1962.

Subjects: 1268 low income residences in Detroit, Mich.  
837 low income residences in Fayette County, Pa.

Methods: Dietary survey.

#### Dietary

Evaluation: Twenty nine percent of families in Detroit, Michigan, and 26% of families in Fayette County, Pennsylvania, had diets that met the recommended allowances for all 8 nutrients in April-May 1961. In September-October after introduction of the Pilot Food Stamp Program, 48% of Detroit families and 39% Fayette County families met the recommended allowances.

## DIETARY STUDIES--continued

### NORTHEAST

#### Maine

- Reference: Gushee, N. I. and Thornbury, M. E.  
Dietary Intake of Family Members in Two Socio-Economic Levels of Living. Abstract of Paper given at 50th Ann. Meeting of Am. Dietet. Assoc., Chicago, Ill., Aug. 16, 1967.
- Subjects: Selected families in 1 Maine community. Socio-economic Level of Living I (higher) and Level of Living II (lower).
- Methods: Evaluation of daily intake of food nutrients.
- Dietary  
Evaluation: Members of Level of Living I had more adequate dietary intakes than the people in Level of Living II. Ascorbic acid and calcium levels were inadequate in men's diets. Women often lacked calcium, iron, ascorbic acid, and vitamin A. Boys had noticeably inadequate intakes of ascorbic acid. Girls' diets were low in iron, ascorbic acid, calcium, and vitamin A. Children's diets were more adequate than other members of the family, and they most often lacked ascorbic acid and iron.

DIETARY STUDIES--continued

NORTHEAST--continued

Massachusetts  
Boston

- Reference: Fry, P. C.  
Diets of Post-Adolescent Young Women. J. Am. Dietet. Assoc. 35: 687, 1959.
- Subjects: 144 women students, aged 18-25 yrs.
- Methods: Daily food records kept by subjects for 7 days. Intake of calories and 8 nutrients calculated.

Dietary

- Evaluation: Sixteen percent were 10% or more overweight; 16% were 10% or more underweight. The percent whose intakes of specific nutrients were less than 70% of the Recommended Dietary Allowances were: for calcium, 57%; iron, 41%; thiamine, 25%; riboflavin, 24%; energy, 23%. Over 2/3 had 90% or more of the allowances for niacin, vitamin A, and ascorbic acid. Only 35% had caloric and thiamine intakes 90% or more of the Recommended Dietary Allowances, while the protein intake of 44% was below this level.

Boston

- Reference: Davidson, C. S., Livermore, J., Anderson, P., and Kaufman, S.  
The Nutrition of a Group of Apparently Healthy Aging Persons. Am. J. Clin. Nutr. 10: 181, 1962.
- Subjects: 104 men and women, aged 51-97 yrs. 2/3 were 70 yrs. or older. Most were middle class and retired.
- Methods: Survey of eating habits, 2-weeks' record of intake kept by subjects. Intake of calories and 8 nutrients calculated; anthropometric measurements made.

Dietary

- Evaluation: The mean intake of protein was 1.24 g/kg of body weight. The protein intake of 17 members was between 0.8 and 1.0; in 4, between 0.6 and 0.8; and in 1, 0.57 g/kg/day. In 39 people protein made up less than 15% of the calories. When supplements were considered with food intake percentages having less than adequate amounts were: for vitamin A, 7%; thiamine, 21%; riboflavin, 37%; niacin, 57%; ascorbic acid, 16%; calcium, 30%; iron, 40%. Body weight was 10% above the desirable weight for 40% and 20% above for 25% of the subjects.

## DIETARY STUDIES--continued

### NORTHEAST--continued

#### New York Rochester

- Reference: LeBovit, C.  
The Food of Older Persons Living at Home. J. Am.  
Dietet. Assoc. 46: 285, 1965.
- Subjects: 283 Rochester, N. Y. households, men, average age,  
74 yrs.; women, average age, 71 yrs. Low-income group.  
2 in 6 households less than \$1000 annual income/person.  
5 in 6, less than \$2000.
- Methods: Data collected by personal interview, using the dietary  
recall method. Information on food used for the week  
preceding. Calories and 7 nutrients calculated.

#### Dietary

- Evaluation: Shortages of calcium and ascorbic acid were the most  
frequent. Only 70% of the households had food supplies  
that met the allowances in full for either of these 2  
nutrients. About 1/4 of the households had food that  
furnished less than 2/3 of the recommended allowances  
in calories or one or more of 7 nutrients. About 1/2  
had food that furnished less than 100% of the Recommended  
Dietary Allowances.

DIETARY STUDIES--continued

NORTHEAST--continued

Pennsylvania  
Bellefonte

- Reference: Pontzer, M. E. and Dodds, M. L.  
Use of Government-Donated Foods in a Rural Community.  
J. Am. Dietet. Assoc. 42: 128, 1963.
- Subjects: 60 households (283 persons) in and around small industrial community in rural part of Pennsylvania. Ages and education of the householders varied widely.
- Methods: Survey of use of government-donated foods by personal interview with the homemaker. 1-day recall of foods eaten by the family. Calories and 8 nutrients calculated.
- Dietary  
Evaluation: Donations of flour, non-fat dried milk, dried peas, beans, lard, butter, and peanut butter added significantly to the adequacy of the diet. However, nutritive content of the diet was below the recommended allowance for calories and riboflavin for more than 1/2; protein, thiamine, and iron for 2/5.

University Park

- Reference: Guthrie, H. A.  
Nutritional Intake of Infants. J. Am. Dietet. Assoc. 43: 120, 1963.
- Subjects: 40 healthy infants, 9 mo.-2 yrs. Patients of a practicing pediatrician in a college town. Homogeneous group in terms of socio-economic background and source of dietary guidance.
- Methods: 7 consecutive days of food records kept by mothers. Calculations for intakes of calories and 7 nutrients.
- Dietary  
Evaluation: Except for iron and ascorbic acid, few infants received from the diet less than 66% of the recommended allowances. Twenty five infants had average intakes below recommended levels and 11 failed to meet 2/3 of the standard. About 1/2 of the diets contained more than the full recommended allowance, but almost 1/2 had less than 2/3 of the recommendations. Five had intakes of 3 nutrients, 5, of 2 nutrients, and 10 of 1 nutrient which were below 2/3 of the recommended allowances.

DIETARY STUDIES--continued

NORTHEAST--continued

Pennsylvania  
University Park

Reference: Riley, M. A. and Dodds, M. L.  
Use of Government-Donated Foods by Married Students.  
J. Am. Dietet. Assoc. 47: 110, 1965.

Subjects: 106 married students (53 families) at Penn State U.,  
68 from N. E. states. 90 children. Income ranged from  
60 to \$260, mean \$171 per month.

Methods: Personal interviews with the homemakers. Information  
on the use of government-donated foods. Calculation of  
calories and of 8 nutrients in 24-hr. dietary.

Dietary

Evaluation: Mean intakes of energy, protein, calcium, iron, vitamin  
A, thiamine, riboflavin, and ascorbic acid exceeded the  
1964 recommended allowances. Intake of niacin was from  
11 to 23 mg. with an average of 17 mg. daily, but was  
35 mg. when the niacin equivalent of the protein was  
added. Nutrients most often below the standard were  
iron and ascorbic acid. Sixty percent of the households  
had iron intakes, 62% ascorbic acid, and 66% vitamin A  
intakes which met the recommended allowances.

DIETARY STUDIES--continued

NORTH CENTRAL

Illinois

3 schools in S. Illinois

Reference: Wharton, M. A.  
Nutritive Intake of Adolescents. J. Am. Dietet. Assoc.  
42: 306, 1963.

Subjects: 421 adolescent boys and girls, 13-18 yrs. "Depressed area." High School in University town, High School in industrial and coal mining town, Southern European stock; High School attended by Negroes.

Methods: 3-day dietary records kept by subjects. Mean daily intakes of calories, fat, protein, three minerals, and five vitamins were calculated and evaluated.

Dietary

Evaluation: The percentage of adolescents who consumed less than 2/3 of the Recommended Dietary Allowances ranged from 9% for protein by boys 13 to 15 years old to 73% for vitamin A by girls of the same age group. The nutrients consumed in the lowest amounts were calcium, iron, vitamin A, and ascorbic acid.

The boys' diets were significantly higher than the girls' for protein, calcium, phosphorus, iron, and riboflavin. The girls consumed a greater proportion of the Recommended Dietary Allowances for calories, niacin, and ascorbic acid. The older adolescents had a higher intake of vitamin A than the younger boys and girls, but 43% of the older boys and 55% of the older girls had less than 2/3 of the recommended amount. The nutrient intake of the Negro group was significantly better than for the whites for calories, iron, vitamin A, thiamine, and niacin.

## DIETARY STUDIES--continued

### NORTH CENTRAL--continued

#### Missouri Columbia

- Reference: Pudelkewicz, C., Gordon, H., and Holck, A.  
An Appraisal of Food Intake by Three Groups of Senior Citizens. Missouri Agric. Exp. Sta. Res. Bul. 839, 36 pp., Sept. 1963.
- Subjects: 27 men, 62 women, 60-95 yrs. Members of Fun Club, residents of home for retired persons, or members of church group.
- Methods: 7-day food intake record appraised by application of USDA daily food plan. Intakes of calories and nutrients were not calculated.
- Dietary  
Evaluation: Men made food selections from the four food groups for an adequate diet. The women did not choose as wisely. The food group consumed in the least adequate amounts was milk.

#### Minnesota St. Paul

- Reference: Dierks, E. C. and Morse, L. M.  
Food Habits and Nutrient Intakes of Preschool Children. J. Am. Dietet. Assoc. 47: 292, 1965.
- Subjects: 121 healthy children, 2-6 yrs., 58 boys, 63 girls. Highly educated parents. (Undergrad. and grad. students at University).
- Methods: 3-day dietary records kept by mothers. 115 records evaluated for intake of calories and 9 nutrients.
- Dietary  
Evaluation: More than 90% of the children had diets which exceeded 75% of the recommended allowances. Some had low intakes of iron, ascorbic acid, and niacin. None of the children had diets low in all nutrients.

DIETARY STUDIES--continued

NORTH CENTRAL--continued

Nebraska

Reference: Fry, P. C., Fox, H. M., and Linkswiler, H.  
Nutrient Intakes of Healthy Older Women. J. Am. Dietet.  
Assoc. 42: 218, 1963.

Subjects: 32 healthy, active women, 65-85 yrs.

Methods: Weighed food intakes or 7-day dietary records; body  
weight. Mean daily intakes of calories and 10 nutrients  
were calculated and evaluated.

Dietary

Evaluation: Forty seven percent of the subjects were underweight,  
6% overweight. In general, the diets consumed by these  
older women provided 2/3 or more of the Recommended  
Dietary Allowances. Iron, calcium, and vitamin A were  
consumed at less satisfactory levels in the diets of  
12, 16, and 19% of the women, respectively. Two women  
consumed diets providing less than half the recommended  
amount of calcium.

DIETARY STUDIES--continued

NORTH CENTRAL--continued

Wisconsin  
Milwaukee

Reference: Jerome, N. W. and Pringle, D. J.  
Socio Cultural Factors and Food Habits of In-Migrant  
Families. Abstract of talk given at 50th Ann. Meeting  
of Am. Dietet. Assoc., Chicago, Ill., Aug. 18, 1967.

Subjects: 63 female household heads of southern (predominantly  
rural) origin. Families headed by in-migrant Negro  
manual workers.

Methods: Food records.

Dietary

Evaluation: A majority of the families met or exceeded the recommended  
allowances for all nutrients except calcium. Calcium was  
the nutrient most frequently below adequate levels.  
Ascorbic acid intake was less frequently below adequate  
levels than calcium.

Milwaukee

Reference: Hankin, J. H. and Antonmattei, J. C.  
Survey of Food Service Practices in Nursing Homes. Am.  
J. Public Health 50: 1137, 1960.

Subjects: 356 aged nursing home patients.

Methods: Estimation of food used during 1 week by inventory  
method. Diets evaluated for energy and 4 nutrients.

Dietary

Evaluation: Sixty two percent of the subjects obtained recommended  
allowances for energy, 75% for protein, 51% for calcium,  
83% for vitamin A, and 40% for ascorbic acid.

## DIETARY STUDIES--continued

### SOUTH

#### District of Columbia

**Reference:** Consumer and Food Economics Research Division. Agric. Res. Serv., USDA. Diets of Households in Washington, D.C. Family Economics Review, pp. 8-11. June 1967.

**Subjects:** 151 households, 3 income levels. 23% had incomes under \$3,000 after taxes in 1962, 30% had \$3,000 to \$5,999, and 30% had \$6,000 or more. The rest gave too little income information to be classified. 1/3 of the households, white; 2/3, nonwhite. Average household size, 3.3 persons, median age of homemaker, 43 yrs., and 46% of the households had children under 15 yrs. of age.

**Methods:** Survey of food consumption.

#### Dietary

**Evaluation:** Average food supply of the households provided more of each nutrient than the National Research Council's Recommended Dietary Allowances. The amount of calcium on the average, was about the same as the recommended allowance. Other studies have indicated that when an average for a group just equals or slightly exceeds an allowance, quite a few households in the group fall below the recommended levels.

DIETARY STUDIES--continued

SOUTH--continued

Maryland and District of Columbia  
Baltimore and Washington area

Reference: McGandy, R. B., Barrows, C. H., Jr., Spanias, A., Meredith, A., Stone, J. L., and Norris, A. H. Nutrient Intakes and Energy Expenditure in Men of Different Ages. J. Gerontol. 21: 581, 1966.

Subjects: 252 men, 20-99 yrs. Most were highly educated, successful men engaged in or retired from professional and managerial occupations.

Methods: Dietary records kept by subjects. Calculations for calories and 8 nutrients. Height, weight, basal oxygen consumption. Calculation of total daily energy expenditures.

Dietary

Evaluation: Intakes of all nutrients, with the possible exception of calcium, were adequate by the standards of the National Research Council for the majority of the men. A significant age-dependent decrease was found in total caloric intake which was accounted for by decrements in basal metabolism and in energy expended in physical activity.

DIETARY STUDIES--continued

SOUTH--continued

Maryland  
Baltimore

- Reference: Skidmore, Katherine  
Study of Head Start Preschool Children's Food Habits.  
Baltimore, Md., 1965. Unpublished Report.
- Subjects: 75 children, age range 4-6 years, randomly selected  
from Head Start Programs in Baltimore City--88% nonwhite  
and 12% Caucasian.
- Method: 24-hour recall of child diet by interview with mother  
in 88% of the cases. In the other 12%, the grandmother,  
aunt, father, or older sister was interviewed.

Dietary

- Evaluation: Of the children studied, 20% had a dark green or yellow  
vegetable four times a week. Twenty four percent never  
ate green vegetables, because they disliked them  
according to their parents. Fifty percent of children  
had a source of vitamin C only once a week or less, and  
46% had some two to four times a week but only 4% had  
this daily.

Lean meat consumption was better than consumption of  
vegetables. About 95% had protein meeting 66% to 100%  
of NRC recommendations. Two-thirds of this group had  
only one glass or less of milk per day.

Sixty five percent of the children drank a sweetened  
beverage daily and 56% had candy daily. Yet many of the  
mothers expressed concern over the high cost of milk.

The school menus made a large contribution to the daily  
intake of essential nutrients.

A medical and dental student assessed the total group  
of children enrolled in Head Start in Baltimore. In  
397 children, who had laboratory studies, the mean  
hematocrit level was 36.76% which is slightly low. In  
the dental examination of 480 children, 48% needed  
dental repair.

DIETARY STUDIES--continued

SOUTH--continued

Mississippi  
Urban

Reference: Dickins, Dorothy  
Use, Knowledge, and Attitudes Concerning Milk by  
Homemakers. Mississippi State U., Agric. Exp. Sta.,  
State College, Bul. 642, pp. 1-15, April 1962.

Subjects: 517 white, 291 Negro urban families. Income of white  
families averaged \$4,827. Income of Negro families  
averaged \$1,747. Average size of white families, 3.41  
persons; Negro families, 3.88.

Methods: Study of the use of milk and milk products.

Dietary

Evaluation: Thirty one percent of the white families and 64% of the  
Negro families had less than 90% of the recommended  
amount of dairy products for families of their size  
and composition.

## DIETARY STUDIES--continued

### SOUTH--continued

#### Mississippi

#### Washington and Sunflower Counties

Reference: ARS, USDA, December 1967.  
A Preliminary Report. The Dietary Situation of Low-Income Households in Two Counties in the Mississippi Delta, May 1967. A Study to Evaluate the Food Stamp and the Food Donation Programs in Washington and Sunflower Counties.

Subjects: Random samples of 510 low income families in 2 contiguous Mississippi Delta Counties. Survey included the families who participated in the USDA food programs and those who were eligible but did not participate.

Methods: Trained interviewers obtained a recall record of the kinds and amounts of foods used at home by the families during the previous 7 days. Information obtained on family size, income, money value of food. Heights and weights were measured on 401 boys and 378 girls 2 to 12 years of age.

#### Dietary

Evaluation: The average diet was poor. More detailed analysis may show that as many as 60% of the families had "poor" diets. The foods most needed by these families to improve their diets are milk products, vegetables, and fruits. Meat, poultry and fish, fats and oils, and sugars and sweets were used in larger quantities than considered necessary for an adequate diet at low cost.

Money value of the food used averaged about \$4 a person a week (including value of free food stamps and donated commodities). This is about \$1.25 less than the cost of the USDA Low-Cost Food Plan for the South.

Families had insufficient income to spend for food. On the average, the families included in the survey spent 40 to 50% of their incomes for food.

Diets of families who participated in food programs were similar in many respects to diets of those who were eligible and did not participate, but some differences were noted.

The children tended to be somewhat short for their age and also heavy for their age and for their height. There were no differences in heights and weights for age of children in families participating in food programs from those in families not participating.

## DIETARY STUDIES--continued

### SOUTH--continued

#### North Carolina Greensboro

Reference: Edwards, C. H., Hogan, G., Spahr, S., and Guilford County Nutrition Committee, Greensboro, North Carolina. Nutrition Survey of 6200 Teen-Age Youth. J. Am. Dietet. Assoc. 45: 543, 1964.

Subjects: 6200 youth in grades 7, 9, 10, and 12 in city schools.

Methods: Students recorded 24-hr. recall of amounts and kinds of foods eaten. Ten percent of records from each grade from each school were evaluated for food intake by 6 food groups, by each meal and snack, and summarized by grade, school, and sex.

#### Dietary

Evaluation: Seventy percent of students had two or more servings of the meat group; 66% had two or more servings from the milk group. Only 16% included one or more serving of green or yellow vegetables, and 35% had one serving of foods rich in ascorbic acid. Two or more servings of other fruits and vegetables were eaten by 64%; 87% consumed recommended amounts of foods from the bread and cereal group. Evaluation by food groups suggest that vitamin A, ascorbic acid, and calcium tended to be low in the diets of the children, especially at the 10th grade level and above.

Information obtained from the survey was used by the Guilford County Nutrition Committee to stimulate interest in and develop a program of nutrition education among people in the county.

## DIETARY STUDIES--continued

### SOUTH--continued

#### North Carolina

##### Rural

Reference: Bryan, A. H. and Anderson, E. L.  
Dietary and Nutritional Problems of Crippled Children  
in Five Rural Counties of North Carolina. Am. J.  
Public Health 55: 1545, 1965.

Subjects: 164 Negro and white crippled children less than 11  
years old.

Methods: Dietary study.

##### Dietary

Evaluation: Diets of 73% were inadequate, generally due to the poor  
economic and educational background of the parents. In  
15% of the children, the inadequate diet was the result  
of difficulties in feeding caused by the physical handi-  
cap.

#### South Carolina

Reference: Lease, E. J., Anderson, H. S., Malphrus, R. K., and  
Lease, J. G.  
Industrial Lunches and Public Health. J. Am. Dietet.  
Assoc. 43: 34, 1963.

Subjects: Employees at textile mills and garment factories.

Methods: Questionnaires about foods provided by 165 textile and  
garment plants with 70,000 employees. 2-week detailed  
study of food bought at a textile mill (1334 lunches);  
and a garment factory (1670 lunches).

##### Dietary

Evaluation: Less than 40% of the plants provided meats or meat  
dishes, juices, salads, or breads, and only 28% offered  
vegetables. The detailed study of textile mill lunches  
indicated that in relation to energy value the average  
contents of all nutrients, especially of iron, vitamin  
A, niacin, and ascorbic acid were low. The lunches at  
the garment factory had low levels of protein, calcium,  
and all of the vitamins when evaluated relative to  
energy value. The improvement which would result from  
the addition of a can of tomato juice, or 1/2 pint  
orange juice, or a serving each of turnip greens and an  
enriched corn muffin, or a glass of fortified skim milk  
is graphically demonstrated.

DIETARY STUDIES--continued

SOUTH--continued

Oklahoma

Reference: Becker, Beryl  
Report of a Study of Food Habits in Oklahoma. State  
Department of Health, Oklahoma City 5, Oklahoma,  
(September 1957-July 1959).

Subjects: 1200, grades 1 through 12. Largely Caucasian, a small  
number of Negroes and Indians. 62% of the total studied  
were 13 years of age or older. 24% were of the 10-12  
year age group.

Methods: Teachers obtained 24-hour recall of diets from students.  
Only week days included in study.

Data processed through IBM 650, were analyzed for nine  
nutrients with number of students who fell into four  
categories for each nutrient.

Dietary

Evaluation: About half (49%) received over full amount of calories  
recommended while 39% received 2/3 of NRC recommendations  
for calories.

A diet was considered "poor" in vitamins, protein, and  
minerals which contained less than 2/3 of NRC Recommended  
Dietary Allowances. On this basis, about half the diets  
were poor in ascorbic acid; 40% in vitamin A; 30% in  
calcium; and 10% were poor in protein.

Higher percentages of the children in the younger age  
group received good diets than the teen-age students  
as judged by ascorbic acid, vitamin A, and calcium in  
the diets.

# DIETARY STUDIES--Continued

## SOUTH - Continued

### Oklahoma

Reference: School Lunch Division, State Department of Education, Vocational Home Economics Department, and six State Teachers' Colleges "Focus on Oklahoma Food Habits" Mimeographed preliminary report, unpublished.

Subjects: 10,000 school children, ages 5 to 18, in every economic section of the State.

Method: Surveyors asked each child daily for four days what he had eaten for each of his meals, snacks between meals, vitamin supplements taken, and what meals he had skipped. Preliminary results tabulated on about 3,000 students.

#### Dietary

Evaluation: The need for nutrition education is as great for those in high income levels as for those in moderate or low income groups. Those children who regularly eat the Type A school lunch fare better nutritionally than those who do not.

Percentage not getting required amounts of nutrients in relation to income levels:

	<u>Below \$3,000</u>	<u>\$3,000 to \$7,000</u>	<u>Over \$7,000</u>
Calories	36.6%	28.8%	29.7%
Proteins	5.9%	3.3%	2.9%
Calcium	47.7%	33.5%	34.7%
Iron	23.4%	24.1%	25.6%
Vitamin A	43.6%	38.3%	34.4%
Thiamine	9.6%	8.4%	8.7%
Riboflavin	10.6%	6.7%	6.2%
Niacin	29.7%	22.8%	21.1%
Vitamin C	41.7%	31.8%	25.3%
Regularly eats Type A Lunch	49.6%	53.8%	42.8%

DIETARY STUDIES--continued

SOUTH--continued

Tennessee

Nashville

Reference: Payton, E., Crump, E. P., and Horton, C. P.  
Growth and Development. 7. Dietary Habits of 571  
Pregnant Southern Negro Women. J. Am. Dietet. Assoc.  
37: 129, 1960.

Subjects: 571 pregnant Negro women.

Methods: Diet records obtained by interview.

Dietary

Evaluation: Mean intakes of vitamin A, riboflavin, thiamine, protein,  
and iron satisfied  $2/3$  or more of the recommended  
allowances. Mean intakes of energy, niacin, and ascorbic  
acid were more than  $1/2$  of the recommended allowances.  
The mean intake of calcium was less than  $1/2$  the  
recommended allowances. Nutrient intakes increased with  
rise in socio-economic status or in level of education.

The noon meal was omitted by 25.6%. Milk was disliked  
by 18% and one or more vegetables by 15.6%.

Nashville

Reference: Crump, E. P., Payton, E., and Horton, C. P.  
Growth and Development. 4. Relationship Between Prenatal  
Maternal Nutrition and Socioeconomic Index, Weight of  
Mother, and Birth Weight of Infant. Am. J. Obstet.  
Gynecol. 77: 562, 1959.

Subjects: 483 pregnant Negro women, 381 attended the hospital  
clinic, 41 attended their private physician, and 61 had  
no prenatal care.

Methods: 7-day menu survey. Diet scored to give a "nutrition index."

Dietary

Evaluation: The mean nutrition index of 49% fell into the category  
considered "fair" and only 19% of the women had diets  
providing about  $2/3$  or more of the recommended allowances.  
There was no significant relation between the nutrition  
of the mother and the weight of her baby. There was a  
slight relation between maternal nutrition and the socio-  
economic index.

## DIETARY STUDIES--continued

### SOUTH--continued

#### Tennessee

Reference: Nutrition Services, Tennessee Department of Public Health. A Report of the Dietary Phase of the Chestuee Nutrition Study 1953-1958.

Subjects: 411 school children in grades 3 through 8, from 9 schools in 3 rural counties.

Methods: One-day food histories taken by nutritionists using 24-hour recall method. Each day of the week except Saturday was represented in the one-day recall histories. Survey covered all seasons. The children were studied for 5 consecutive years, with the initial survey beginning with third and fourth grade pupils.

Physical appraisals and laboratory studies were made on these children, but no attempt was made to correlate this information with dietary histories.

#### Dietary

Evaluation: About 95% of the children consumed one cup of milk daily. However, only 15% had three or more cups. Cheese was not used by these families.

Lean meat was reported by 70% of children and 45% had eggs when surveyed. Dried beans was frequently mentioned as the main dish for supper. Only half the subjects had a good source of vitamin C. Vitamin A-containing foods were consumed three or more times per week by 80% of subjects. Sweets, such as candy and cookies were reported as often as dried beans and more often than eggs.

Seventy five percent of the children surveyed ate a school lunch, which, in many instances, was the best meal of the day for a child.

DIETARY STUDIES--continued

SOUTH--continued

Texas  
Denton

- Reference: Mays, R. W. and Scoular, F. I.  
Food Eaten by Athletes. J. Am. Dietet. Assoc. 39:  
225, 1961.
- Subjects: 34 college football players, 16 basketball players, and  
10 track athletes. Average age, 19.8 yrs. (18-25).  
Average weights for the groups were 198, 185, and 157  
lbs., respectively.
- Methods: Food served in a college dining room was recorded for  
5 days each during training, during the competition  
season, and during a period of resting from sports.
- Dietary  
Evaluation: Average energy intake was 4400 kilocalories per day.  
The proportion of energy provided by each of the  
foodstuffs was 13-16% from protein, 42-46% from fat,  
and 38-44% from carbohydrate.

For football players, the average daily intakes of  
nutrients were 1.86 gm. calcium, 25 mg. iron, 12,476  
I.U. vitamin A, 2.70 mg. thiamine, 3.41 mg. riboflavin,  
51 mg. niacin and equivalents, and 161 mg. ascorbic  
acid. Intakes by other groups were similar. The high  
calorie diets contributed minerals and vitamins in  
excess of the adjusted recommended allowances.

## DIETARY STUDIES--continued

### SOUTH--continued

#### Texas

- Reference: Speakman, Perle, et al.  
Breaking the Communication Barrier. Texas Health Bulletin, January-February 1965.
- Subjects: Prenatal patients in caseload of six public health nurses in Abilene-Taylor Co. Health Dept. The number of subjects involved not given.
- Methods: Three-day diet records, check list on kitchen facilities, methods of food preparation, where and how shopping was done. The MCH nutritionist of State Health Department was consultant on methodology, but nurses obtained data in clinic and home visits.

#### Dietary

- Evaluation: Consumption of protein-rich food limited in amount and variety; vegetables, especially green or yellow vegetables, were limited in variety and amount. Bakery breads were used most, but many families baked flour tortillas daily. Dry cereals were commonly used, also rice, cream of wheat. Food was purchased on "pay day" when husband was employed.

The nurses felt this study substantiated their concern for the "poor" nutrition of their patients. They also learned that some of the meals consumed by patients, such as beans and tortillas, were not as lacking in nutrients as one might assume.

## DIETARY STUDIES--continued

### SOUTH--continued

#### Texas Statewide

Reference: Stubbs, Alice  
Food Use and Potential Nutritional Level of 1,225 Texas Families. Bul. 1033, April 1965, Texas A and M U., Texas Agric. Exp. Sta.

Subjects: 1,225 Texas families. Both white and Negro.

Methods: Kinds and amounts of food used by the family for past 7 days were obtained by interview of homemaker.

#### Dietary

Evaluation: White and Negro families did not vary a great deal in overall food consumption either in type or amount. The most notable difference was the very low use of dairy products by Negro families. The three nutrients most frequently below adequate levels were ascorbic acid, thiamine, and calcium. Family groups where diets were most frequently inadequate were those with teen-age children and those with children in two or more age groups.

DIETARY STUDIES--continued

WEST

California  
Berkeley

Reference: Hampton, M. C., Huenemann, R. L., Shapiro, L. R., and Mitchell, B. W.  
Caloric and Nutrient Intakes of Teen-agers. J. Am. Dietet. Assoc. 50: 385, 1967.

Subjects: 122 Caucasian, Negro, and Oriental teen-agers.

Methods: 7-day dietary records in summer 1963, spring and summer 1964, and spring 1965.

Dietary

Evaluation: A greater percent of teen-agers, particularly girls, chose diets furnishing less than 2/3 of the Recommended Dietary Allowances for calcium and iron than for other nutrients. Negroes and those in the lower socio-economic group tended to have lower intakes of nutrients than others. Average range of eating frequency was from 2 to 6 times a day.

No relationship was found between school performance as measured by grade point average and the quality of the diet as measured by the number of nutrients below 2/3 of the Recommended Dietary Allowances.

## DIETARY STUDIES--continued

### WEST--continued

#### California

##### Berkeley

Reference: Shapiro, L. R., Huenemann, R. L., and Hampton, M. C. Dietary Survey for Planning a Local Nutrition Program. Public Health Rep., Washington 77: 257, 1962.

Subjects: 209 households. 1st group mainly Negro, considerably lower income level than 2nd group, mainly Caucasian.

Methods: Food intakes for preceding 24 hours estimated from interview. Evaluated seven nutrients.

#### Dietary

Evaluation: Forty five percent of first group and 57% of second group met or exceeded 2/3 of recommended allowances for 7 nutrients studied. In both groups, the nutrients most often lacking were vitamin A, thiamine, ascorbic acid, and calcium. Protein intake was above the recommended allowance for 80% of the households. No correlation between nutrient intake and income or expenditure on food. Vitamin supplements were taken by 39% of individuals in first group and 60% of those in second group.

# DIETARY STUDIES--continued

## WEST--continued

### California

#### San Mateo County

Reference: Steinkamp, R. C., Cohen, N. L., and Walsh, H. E.  
Resurvey of an Aging Population--fourteen-year follow-up.  
The San Mateo Nutrition Study. J. Am. Dietet. Assoc.  
46: 103, 1965.

Subjects: 273 men and women still available from healthy subjects  
over 50 yrs. of age studied in San Mateo County in 1948.  
Average age in 1962-63 was 74.5 yrs. for men and 75.5  
yrs. for women.

Methods: Nutrient intakes calculated from 24-hour diet records.  
Subjects were weighed. Health reports investigated.

#### Dietary

Evaluation: Percent with intakes below 2/3 of the Recommended  
Dietary Allowances of 1964:

	Men	Women
Calories-----	22%	11%
Protein-----	12%	8%
Calcium-----	25%	45%
Iron-----	0%	5%
Vitamin A-----	24%	27%
Thiamine-----	12%	4%
Riboflavin-----	7%	10%
Ascorbic acid-----	25%	19%

When niacin equivalents were calculated from an estimate  
of tryptophan intakes as well as preformed niacin, only  
the women 75 years and older had intakes less than 2/3  
of the recommended amounts.

Although 35% took vitamin or mineral supplements, they  
were usually taken by persons with adequate nutrient  
intakes. In relatively few instances did the vitamin  
or mineral supplements provide the specific nutrients  
needed by the persons taking them.

About 30% of the subjects were 10% or more overweight.

Although chronic conditions were numerous, few of this  
aging population were significantly incapacitated. The  
leading causes of death for 217 subjects studied in 1948  
were cardiovascular diseases and malignant neoplasms.

DIETARY STUDIES--continued

WEST--continued

Colorado  
Denver

- Reference: Beal, V. A.  
Dietary Intake of Individuals Followed Through Infancy  
and Childhood. Am. J. Public Health 51: 1107, 1961.
- Subjects: 38 healthy children.
- Methods: Nutritional histories taken for 14 yrs., monthly during  
the 1st year and every 3 months from 1 to 8 yrs.
- Dietary  
Evaluation: There was a tendency toward very high rather than very  
low intakes.

During the first 6 months, intakes of all nutrients rose smoothly. In late infancy and early preschool period, intakes of calcium, phosphorus, iron, vitamin A, and riboflavin decreased and of other nutrients remained constant or increased slightly. In school years up to adolescence, there was a slow but steady increase in all nutrient intakes, except for vitamin A and ascorbic acid which fluctuated with season.

DIETARY STUDIES--continued

VIRGIN ISLANDS

St. Thomas

Reference: Sprauve, M. E. and Dodds, M. L.  
Dietary Survey of Adolescents in the Virgin Islands.  
J. Am. Dietet. Assoc. 47: 287, 1965.

Subjects: 68 subjects, 22 boys, mean age 17.7 yrs.; 46 girls,  
mean age 17.1 yrs.

Methods: 7-day consecutive food intakes recorded by subjects.  
Calculations for calories and 9 nutrients.

Dietary

Evaluation: In general, the diets recorded provided 2/3 of the  
recommended nutrients, with the exception of calcium.  
Average intakes of both boys and girls exceeded the  
vitamin A and ascorbic acid allowances. Children  
taking school lunches had higher intakes of calcium  
and vitamin A than those who lunched at home. Fifty  
nine percent of the subjects participated in the  
school lunch program.

General

Reference: Williams, R. O. and Brush, M. K.  
Family Food Habits in the Virgin Islands. J. Home  
Econ. 57(8): 641, 1965.

Subjects: 15 urban and rural families living in Virgin Islands.  
Nearly all regarded as low-income.

Methods: 24-hr. dietary obtained by a public health nutritionist.  
Calculation of calories and 8 nutrients.

Dietary

Evaluation: Information concerning the dietary habits of 15 families  
living in the Virgin Islands and analysis of typical  
diet are presented. Protein, vitamin A, ascorbic acid,  
and the 3 B vitamins calculated were present in adequate  
amounts. The iron and calcium intakes were below the  
Recommended Dietary Allowances.

DIETARY STUDIES--continued

VIRGIN ISLANDS--continued

St. Croix and St. Thomas

Reference: Nutritionists, Virgin Islands Dept. of Health.  
Food and Nutrition Survey, March-May 1965. Unpublished  
Report.

Subjects: 240 boys and girls 16-19 years of age from high schools  
in St. Croix and St. Thomas.

Methods: Diet history--one day recall check list filled in by  
student.

Dietary

Evaluation: The food groups most often lacking were green and yellow  
vegetables, citrus fruits, and tomatoes and milk.

The consumption of candy, soft drinks, coffee, and tea  
appeared to be as high or higher than of the food groups  
which deliver more of the essential nutrients along with  
calories.







